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Issues in Applied Linguistics

MAIN ARTICLES

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EXCHANGE

ERRATA

From Volume 5, Number 1 of *Issues in Applied Linguistics* (June, 1994):

In David Leech's review of the book by R. Nattinger and S. DeCarrico, *Lexical Phrases and Language Teaching*, the following corrections should be noted:

--On page 161, the final paragraph should read: "The problem for applied linguists has been that these epistemologically motivated isolations of interpretation from grammar, and of syntactic rules from lexical lists, preclude adequate accounts of the daily output of natural language by real, as opposed to 'ideal,' speakers in a discourse community."

--On page 163, the final sentence of the first full paragraph should read: "It is not convincing to operate *a priori* on the premise that a representative sample of LPs is accessible at a conscious level, and that once slapped with notional-functional 'speech act' labels and given minimal structural description, the job is finished."

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New Directions

Issues in Applied Linguistics began five years ago in response to the need for graduate students and faculty in applied linguistics to publish and share their work with their colleagues and friends, as well as the necessity to define and re-define our field, which grew as our discipline seemed to broaden and diversify. Now, as we enter our fifth successful year, we are able to rest somewhat on the foundations laid by our predecessors, while keeping a watchful eye on the future. No longer do we sense the urgency to define ourselves or our research; and, thanks to our faithful subscribers, we no longer question the stability of our readership or supporters. This fifth anniversary issue marks a shift from less certain times to a more confident future, providing us with the opportunity to re-invoke some of the ideas that started the journal--just as the founders of *IAL* did, we continue to see *IAL* as a forum for expressing the diversity of research on all aspects of language as well as a showcase for such research for applied linguistics students and faculty across disciplines.

We believe these goals are brought forth in the current issue, through not only the numerous student contributions (articles and book reviews, as well as editorial and production assistance) but also the broad representation of the field of applied linguistics. All book reviews in this issue are student-authored and topics include conversation analysis (Gonzales), traditional linguistics (Lagunoff) and ESL interactive video (Henschel). Full length articles cover topics ranging from classroom discourse (Poole and Patthey-Chavez) to ESL specific research (Leech; Jacobs; Davies; Osburne & Mulling) to quantitative language analysis (Williams). The current issue also features a response by Foong-Ha Yap and Yasuhiro Shirai in their long running dialogue with Cheryl Fantuzzi. While this debate will most likely continue, we have decided to open

up the Exchange Section to other contributors on other topics, and this article will, therefore, be the last of this particular public dialogue in *IAL* for some time.

The quality and diversity represented in this issue are due in great part to our reviewers. During the past five years, *IAL* has established a substantial list of well respected referees in the field and we continue to add to our list with each issue, ensuring an equitable evaluation of submissions and enhancing the quality and reputation of the journal. In addition, we have received a great deal of help from faculty and past editors. This issue would not have been possible without the support and advice of the previous editors, Sally Jacoby, Patrick Gonzales, and Joseph R. Plummer. Also, *IAL* is fortunate to have received the day to day support of Prof. John Schumann and the *IAL* computer, a generous contribution from Prof. Elinor Ochs.

As new editors we also have brought some changes to *Issues in Applied Linguistics*, one of which is the sharing of editorial responsibilities through co-editorship. We are proud to say, too, that many graduate students within the department have contributed substantially to the production of the journal. All this collaboration has allowed us to maintain the enthusiasm and energy to pursue new ideas as the field of applied linguistics expands.

In recent years, the social sciences have begun to shift their focus to linguistic issues and we foresee an ever greater variety of interdisciplinary research emerging in *IAL*. The upcoming speical thematic issues, *Applied Linguistics from an East Asian Perspective* (5.2) and *Sociolinguistics and Language Minorities* (6.1) are being compiled with just this new academic perspective in mind. With continued enthusiasm and support from applied linguistics graduate students and faculty, we hope to foster increased recognition in our field and beyond.

June 1994   Betsy Kreuter and Susan Strauss

Locating Assisted Performance: A Study of Instructional Activity Settings and their Effects on the Discourse of Teaching

Deborah Poole
San Diego State University
G. Genevieve Patthey-Chavez[1]
Los Angeles City College

In an effort to locate instances of Tharp and Gallimore's assisted performance in educational settings, teacher-student interactions in typical teacher-fronted classrooms are contrasted with the organization of talk across a variety of alternate educational participant structures—a teacher-student conference, small group work, the making of a class video, and a problem-solving interaction in a computer lab—that deviate from the traditional "default script" (Cazden, 1988, p. 53) of classroom interactions. We consider how each learning arrangement affects the extent to which students are able to initiate, control, and maintain interaction, and the extent to which their agendas are articulated. We further consider the influence exerted by the multiple facets of each encounter's institutional and interpersonal context. This range of influences precludes a monolithic transfer of knowledge, pointing to the obviously agentive role of the novice as well as to ways in which historical and institutional expectations are represented (or altered) in interactional encounters. Hence, locating assisted performance uncovers a web of relationships among participants, tasks, and talk that both facilitate and constrain learning in a given novice-expert episode.

INTRODUCTION

Ordinary classrooms contain most of the elements that can create rich, rewarding learning experiences for teachers and students. Routinely attaining such experiences, however, can prove both difficult and elusive, as a great variety of classroom research attests (e.g., Goodlad, 1984; Lemke, 1991; Cazden, 1988;

Patthey-Chavez & Goldenberg, 1994). In the broadly focused and influential work of Tharp and Gallimore (1988), underlying dimensions of this difficulty are addressed as the authors reconceptualize the very definition of teaching. In their view, instructional encounters are most often characterized by teacher direction and evaluation, with students assuming the task of learning or performing independently; that is, very little time is devoted to helping students directly in the act of learning. Tharp and Gallimore argue that this model of *direction-performance-evaluation* must be replaced and, to this end, offer a redefinition of teaching as *assisted performance* (AP), where teachers "rouse minds to life" by helping students to meet and master instructional challenges. They charge that teachers must fundamentally reconceptualize their task as one of assisting students to perform at levels beyond what they can do alone. Furthermore, this revisioning must be appropriated by practitioners and administrators at all levels of the educational hierarchy; just as the task of teachers should be to assist the performance of students, the task of supervisors or principals should be to assist the performance of teachers.

Identifying educational settings in which "assisted performance" occurs, as well as the factors which account for its emergence, are the concerns of this paper. In particular, we are interested in focusing on the *language* of such settings as a means of specifying with some precision how assisted performance evolves and what interactional shape it takes. This focus reflects our view that analyses of instructional language are crucial to in-depth understanding of educational contexts and that, from a linguistic perspective, such contexts remain underanalyzed in the classroom research literature.

Our attempts to "locate" instances of assisted performance suggest that it is particularly difficult to find in the teacher-fronted, whole-class setting. As repeatedly demonstrated in classroom discourse research (Cazden, 1988; Lemke, 1991; Griffin & Humphrey, 1978; Mehan, 1979; Poole, 1990; Sinclair & Coulthard, 1975), teacher-fronted settings are pervasively characterized by the initiation-reply-evaluate (IRE) sequence, which in many instances functions as the interactional instantiation of the direct-perform-evaluate paradigm identified by Tharp and Gallimore. Cazden has fittingly termed such IRE-based interaction the "default script"—in her words, "what happens unless deliberate action is taken to

achieve some alternative" (1988, p.53). In an effort to focus our investigations beyond IRE sequences and the default script, here we analyze novice-expert interactions across a range of *alternate* instructional participant structures (Philips, 1983)—specifically, writing conferences, small group work, a class-made video, and client-consultant interactions in a computer lab—and juxtapose them with more familiar IRE-based lessons. We consider how characteristics of physical and institutional arrangements not only allow for assisted performance, but also how those characteristics affect the nature and extent of expert assistance. Our findings suggest that while participant structure can become a readily available resource to engender change in the default script, the institutional context within which activities are embedded remains a powerful, at times inhibiting, force.

Theoretical Background: The ZPD and Activity Theory

Tharp and Gallimore's concept of assisted performance was inspired by Vygotsky's original admonition that effective instruction precedes and anticipates development (1978, p. 104). Their "assisted performance" defines "what a [novice] can do with help, with the support of the environment, or others, and of the self," (Tharp & Gallimore, 1988, p. 30). Developed for educators, its very wording articulates the two key components of Vygotsky's primary vehicle for effective instruction, the "zone of proximal development" (ZPD): performance by the novice and assistance by the expert. In this view, expert guidance amplifies novice performance, but does so by drawing on novice contributions.

Staying close to Vygotsky's construct allows Tharp and Gallimore to capitalize on the extensive body of research supporting the value of the ZPD. The work of Cole (1985), Griffin and Cole (1984), Rogoff (1990), and Wertsch (1985a; 1985b) documents the effectiveness of ZPD-mediated instructions in many settings. At the same time, the construct has been reviewed and expanded by Vygotsky's students almost from its inception, in part to realize Vygotsky's own ambition to build a comprehensive theory of human development. The resulting theoretical framework—perhaps best known as 'activity theory'—is much less familiar to Western audiences, and has not accumulated the empirical backing enjoyed by the ZPD. It has, however, addressed a few inadequacies in the ZPD's original conceptualization.

While Vygotsky's social account of human development was certainly revolutionary, it was based on a primarily dyadic perspective: Caretakers and social settings are resources for the human child, who appropriates from them socially constructed knowledge. The caretaker's contributions tended to be privileged, with the novice often assuming a recipient-role in the learning process. The issue of novice influence in the ZPD is brought into focus in this study as students are shown to be the *initiators* of learning encounters across several distinct activity settings.   In these cases, the content of instruction in the ZPD is determined largely by the novice, a circumstance which points to the importance of another dimension of assisted performance-namely the role of the novice in establishing and carrying out the learning agenda.

Activity theory also locates the larger societal origins of the zone. Vygotsky explored neither the extensive social networks nor the material resources on which caretakers drew before they could offer expert-assistance to novices. From an activity-theoretical perspective, these resources undergird the ZPD, thus playing a key role in fostering (or inhibiting) the emergence of complex thinking (Engeström, 1987). By addressing the larger social forces that create learning environments, activity theory shifts the essentially psychological thrust of much of Vygotsky's early writing towards a more sociological one. Our data has convinced us of the value of this theoretical elaboration; any observer of school discourse practices soon realizes that they are profoundly influenced by their larger settings. The material and social organization of schools reflects their history, and frequently mediates between competing, even conflicting belief systems about what constitutes a "good education."

This observation is partly motivated by the second seminal perspective informing our analysis, the view that social practices originate in the minimal elements of everyday interactions, which in turn reflect the contexts within which they occur (Duranti & Goodwin, 1992; Mehan, 1978, 1979; Mehan & Wood, 1976; Ochs, 1988). In other words, social activities and the discourse used to enact them are *mutually constitutive* phenomena which reflect and mediate one another. It is because of that dialectical relationship that discourse practices are an especially rich source of information about the social and institutional forces shaping the school environment. In Bakhtin's terms, they are replete with the voices

of former users (1981, p. 293-294), and thus provide a window onto the ideas and inclinations that have shaped and continue to influence instructional agendas and their realizations.

In sum, teaching and learning are processes invariably imbued with powerful social and affective undercurrents presenting an additional challenge to the discourse skills of experts and novices. Our effort to locate assisted performance in a variety of instructional settings forces us to probe the multiple and interconnected layers of meaning encapsulated in instructional discourse. This probing, in turn, leads to the links between discourse processes, actions, and settings that account for one event's successful transformation into assisted performance and another's failure.

DATA AND METHODOLOGY

The data analyzed below were pulled from a corpus of instructional discourses collected since 1988 in a variety of educational settings for several in-depth sociolinguistic studies (Ferris, Ferris, Hared, Kowall, & Patthey, 1989; Patthey, 1991; Poole, 1990). Our concerns are two-fold: First, we are characterizing routine instructional language use in both traditional and non-traditional teaching/learning encounters, with a particular emphasis on specifying the ways instructional discourse can vary as contexts change, or alternatively, to change contexts. Second, we are exploring the structuring influence of larger social and institutional forces on observed discourse practices. In collecting the corpus, we strive for both representativeness and variety. It presently encompasses lessons from kindergarten, elementary, middle school, adult, and college education, as well as writing conferences, community-based literacy tutoring sessions, and computer lab problem-solving sessions.

In selecting data for the present study, we deliberately focused on situations diverging from the default script and appearing to represent instances of assisted performance. The data were taken from adult settings, primarily because a greater variety of discourse strategies prevailed in these settings than in the vast majority of "regular" schools.[2] They include, in addition to teacher-fronted interaction, the settings listed below:

1. Teacher-student writing conferences in a freshman writing course;
2. Small group work in a state-funded adult school;
3. A class-made video in a beginning ESL course;
4. Consultant-client interaction in an open-access university computer lab.

Figure 1 depicts the spatial arrangements of these settings. This graphic representation suggests that the discourse differences that emerged can be attributed in part to the physical arrangements of the participants (cf. Philips, 1983); and while we will argue that this is the case, we also point to the wider institutional influences that frequently undergird and are reflected in such arrangements.
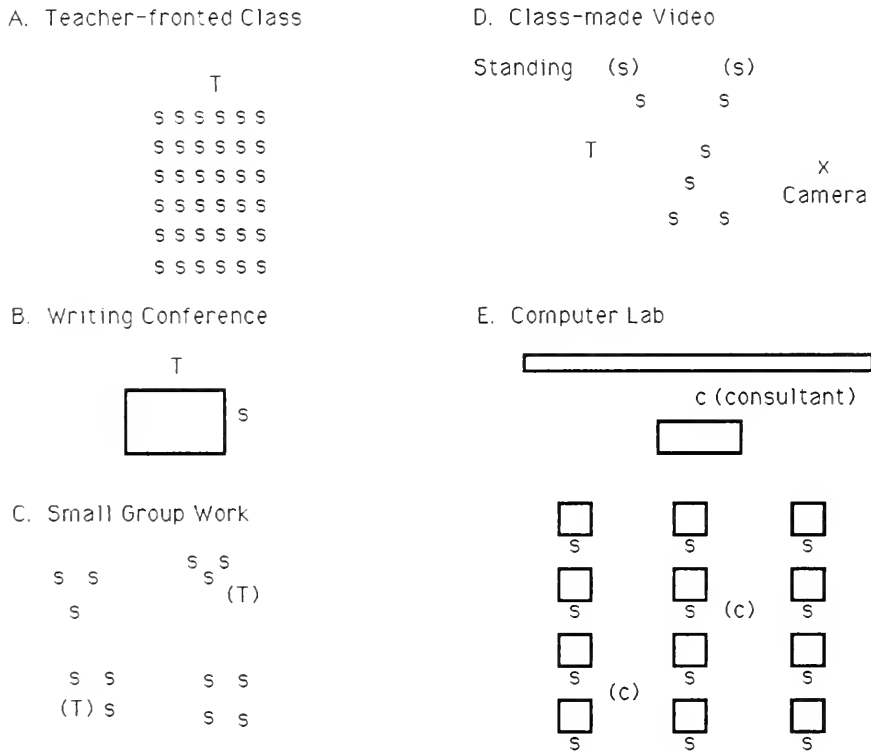
Figure 1: Participant Structures

Audio taped data from each setting were transcribed using a modified version of the Jefferson conventions (Sacks, Schegloff, & Jefferson, 1974; see Appendix A) and analyzed in terms of several interactional phenomena; these included the role of student or teacher in initiating interaction and authoring content of a learning encounter, the constitution of teacher evaluation moves, and the distribution of talk between novice and expert—phenomena we take to index important beliefs about communicative rights and responsibilities assumed by different participants. In using discourse choices as indices to underlying beliefs, we are following Ochs' (1992) and Suchman's (1987) applications of the "documentary method" originally articulated by Garfinkel (1967). According to this view, language choices (as well as other communicative behaviors) do not simply encode a speaker's intentions, but set in motion interpretive processes through which speakers and listeners arrive at jointly negotiated meanings. These situated interpretations will contain a host of social and affective undercurrents which are invoked at the same time as the referential meanings of a given string of words.

The two crucial parameters sensitive to different instructional styles that needed to be operationalized were: a) the participant structure of a given encounter, or its speaking rights and responsibilities; and b) the authorship of lesson content. While tracking the first of these is relatively straightforward, the second forces a detailed analysis of thematic and semantic relationships across turns of speech and across different speakers. For this, Poole's (1990) work on the larger discursive embedding of IRE-sequences, became a primary methodological precursor.   In addition, Ochs, Taylor, Rudolph, and Smith's (1992) work on the multi-party production of coherent problem-solving narratives at family dinners suggested ways in which the multiple research perspectives invoked here can be combined to address both micro-analytical phenomena and the larger social forces influencing them.

Characteristics of the Teacher-Fronted Script

The teacher-fronted participant structure—and the (typically) concomitant default script of teacher-student interaction (Cazden, 1988)—remains dominant in many educational settings. As Tharp and Gallimore note, "for many schools, the whole-group setting is the only activity setting and it lasts the entire instructional

day" (1988, p. 163). They acknowledge that assisted performance is difficult if not impossible to achieve within this dominant instructional arrangement, where instructional discourse can most often be characterized as "recitation." Goodlad's study of over 1,000 classrooms similarly found the teacher-fronted setting to dominate, with students overwhelmingly being lectured to or doing written seat-work: "The amount of time spent in any other kind of activity (e.g., role playing, small group planning, problem solving, etc.) was minuscule" (1984, p. 230). A related finding in the Goodlad study was a gross imbalance between the amount of teacher and student talk. In his words:

> If teachers in the talking mode and students in the listening mode is what we want, rest assured that we have it. These findings are so consistent in the schools of our sample that I have difficulty assuming that things are much different in schools elsewhere. (1984, p. 229)

The perspective advocated here is that the difficulty with achieving assisted performance in the whole class setting is tied to the teacher-fronted spatial arrangement and the historical organization of talk which accompanies it. Specifically, we contend that the widely documented initiation-reply-evaluation sequence (Cazden 1988; Griffin & Humphrey, 1978; Lemke, 1991; Mehan, 1979; Sinclair & Coulthard, 1975) in many instances impedes or precludes the emergence of assisted performance. To support this view, we draw on Poole's (1990) recent account of IRE-sequences, which identifies the larger network of teacher-utterances necessary to instantiate many teacher-fronted activities.

In Poole's analysis, the organization of classroom talk is conceptualized as an activity in its entirety; IRE sequences are shown to be embedded in an extensive framework of teacher utterances where ratified student talk typically does not occur. For example, teachers often frame (i.e., initiate, direct, and close) both instructional activities (example A) and topic sequences within those activities (example B) with lengthy single turns within which student talk may be viewed as disruptive or off topic.

(A) Opening frame—Second Grade English for LEP students

> T: <u>Now</u> if you would please put everything you have underneath your chair (.) your pencils and papers so that you can look up here and

concentrate and pay really good attention (.) I like the way I see Nasreen's eyes, she's ready. now. <u>we've</u> been talking about <u>what country</u> and let's speak in <u>whole</u> sentences today okay, like we always do.

(B) Topic Sequence Frame—Developmental Writing/University

T: Monica and I both felt that we are seeing fewer and fewer run-ons-somehow they're all getting on the same papers now. One person had about twenty run-ons (.) in an essay so that person really needs to work but some of you—most of you—are getting it and are paying much more attention to punctuation and I'm really glad because that's going to let you learn how to <u>mani</u>pulate sentences and vary sentence length and all those important things. okay.

In addition to such opening turns, both instructional activities and topic sequences within them can be concluded with further teacher utterances, where again student talk is unlikely to occur. Within such a structure, Poole argues that student talk consists largely of a single conversational act or move—the "reply" within the IRE. In other words, the organization of talk in many classroom lessons consists of multiple teacher moves which embed and direct a single student act. In addition, talk is structured so that the floor cannot remain with the student for long, as the reply is typically followed by an evaluation which signals the next move to be the teacher's. This structure in effect precludes options available in the adjacency-pair ordered interaction characteristic of conversations and other more symmetrical or informal contexts (Griffin & Humphrey, 1978). Options such as a shift in the role of initiator, for example, seldom characterize teacher-fronted interactions, resulting in the low frequency of student questions documented in classroom research (Bennett, 1986; Goodlad, 1984).

A second characteristic of the reply move follows from its status as the answer to a teacher-constructed initiation. Within the default script, initiation and reply moves typically constitute a test-question and answer, the familiar asymmetrical sequence in which the expert poses a question to which he or she already has an answer in mind. In viewing this sequence, we draw on Ochs, Schieffelin, and Platt's (1979) analysis of test-questions as "propositions across utterances and speakers." Their analysis proposes that a test-question and its answer are two parts of the same proposition, an interpretation which suggests that when

students speak within the IRE sequence they participate in verbalizing a teacher-formulated proposition (Poole, 1994). In other words, the teacher not only controls the extent and placement of student talk, but its propositional content as well.

In sum, student talk within the default script largely consists of the "reply" move within the IRE, a move which can be characterized as 1) a single conversational act supported by a network of teacher utterances, and 2) the verbal completion of a teacher-formulated proposition. Bluntly stated, the organization of typical classroom talk is skewed to maximize the quantity of teacher talk over student talk and to encourage teacher control of both the placement and content of student utterances. In the discussion to follow, we will juxtapose these characteristics of teacher-fronted instruction with the discourse emerging from the alternate participant structures we examine. In particular, we are interested in identifying the parameters of participant structures which serve to evoke (or suppress) assisted performance. In taking such an approach, we are working toward a goal of predicting what factors characterize educational settings where assisted performance is the norm rather than the exception.

Conferencing

A typical example of a teacher-led ZPD can be found in conferencing, a popular strategy in writing instruction often displacing more traditional methods like lecturing or error-correction (Freedman, 1985; Garrison, 1974; Jacobs, 1983). A conference-based curriculum reflects a philosophy that writing is more than the sum of its parts and that students should experience the entire process of composing and putting ideas to paper. A teacher opting for a writing process curriculum typically meets with students, either individually or in small groups, to discuss a student paper and suggest possible improvements. The paper is not considered a finished product and its development serves as a learning opportunity for student writers.

In keeping with this philosophy, a number of strictures about conducting successful conferences have developed. Conferences ought to be "student-centered" events, a chance for students to go over and re-articulate their thoughts with help from the teacher. Through this conference-discussion an expanded and, hopefully, improved paper is constructed for the student to

appropriate. This proposed instructional strategy bears a striking resemblance to Tharp and Gallimore's notion of "assisted performance." Moreover, post-conference improvements in student-writing are consistent with changes predicted by their framework: The post-conference drafts collected by Ferris, Ferris, Hared, Kowall, and Patthey (1989) and Goldstein and Conrad (1990), for example, could be linked to the conference-talk and reflected changes negotiated during conferences.

Two important and in some ways counter-balancing factors affect the distribution and organization of talk during conferencing. The classic one-on-one interactional arrangement of most conferences is reflected in a more conversational style, particularly with respect to the establishment and maintenance of intersubjectivity. Conferees enlist each other's participation in the talk and they offer and monitor participation-flagging back-channel cues continuously once a discussion is under way. This trend, however, is counter-weighed by the asymmetrical power relationship between the two participants favoring the contributions of the expert. The push and pull of these two forces is palpable in the conference-data examined here.

The excerpt below was culled from a larger corpus collected by Ferris, Ferris, Hared, Kowall, and Patthey (1989) in a freshmen writing program at a large private urban university. Students had been asked to discuss the origin of human intelligence and to take a position on whether it was mostly a result of nature or nurture. They had then been asked to write a paper explaining and defending their positions; the segment below comes from the conference immediately following the writing of that first draft. In that segment, a very businesslike teacher almost immediately prompts her student to formulate an expanded, essentially "improved" position-statement for the beginning of her essay. She thus formally turns over the conversation to the student soon after the conference has started and relatively long stretches of student-discourse ensue.

On the face of it, the interaction is much less teacher-dominated than in the teacher-fronted case. However, the true power relationship between the two is revealed in a number of indices, some to be found even *within the student-discourse itself.* The entire topic-sequence concerned with the elaboration of student R's position statement is reproduced below. The teacher first reconciles a popular requirement for positive student feedback

with her own need for efficient time-use by opting for the classic "wonderful but" opening strategy. That strategy leads straight into her instructional concerns, thereby revealing her agenda for the encounter. The topic sequence as a whole is in fact threaded together as the teacher pursues that agenda. She names and qualifies the problem as she sees it in her initial turns (5 and 7), pursues it extensively as the conversation develops (turns 5, 7, 9, 11, 13, and 27) and returns to it in her concluding recommendation (turn 31). Together, the initiating and concluding teacher-turns frame the sequence as a communicative problem for the student to solve. Within that frame, the teacher constructs a verbal problem-solving scaffold for the student by assuming the role of a critical audience eliciting clarifications. Her verbal moves set up a communicative challenge and provide assistance at the same time. Thus a sequence of assisted performance develops during which the teacher first assists in the production of a more audience-friendly student-proposition (turns 11 and 13), then helps clarify it (turn 19) after the student rises to the challenge (turns 12, 14, 16, and 18). She does not resume her teaching voice until after the student has attempted to explain her thinking (turns 22, 24, and 26):

Example (1)   Conferencing

	01	T	'kay I really really like, um, your position.
			I think it's very interesting,
			and I think it's different,
			from what a lot of people would say,
	02	S	((softly)) okay
	03	T	right off the bat,
			and I really think that, it's it's a position that,
			you should develop, I mean, tell me much more about, okay?
	04	S	(un-huh)
Problem →	05	T	d, um, I'm saying here that, you don't support it,
qualified			and that part of the reason seems to be that um,
			you're making assumptions about your audience,
P. qu →	06	S	(what) they already know,
	07	T	that, what that they already know. that may not be true,
			and that you need to do,
			a better job of [telling your audience what you're thinking.]
	08	S	[okay, you want me to ((unintelligible))]
Tchr AP→	09	T	yeah so what, I mean tell. me just now here now.
set-up			why do you think (1)

```
                     let's see, where was it,  (2)
                     all those final things here, which is, the most fascinating, position.
                     ((reads)) the reason, the main reason behind intelligence is,
                     being the result of mostly nature is God father,
                     of nature itself. okay
                     now that's an interesting position,
            10  S                                        un-huh
AP setup → 11  T    tell me more about, that position.
            12  S    God     [(being father of),
AP setup → 13  T              [I mean how does, how does, God, in- you know,
                       affect nature,  and how does nature then produce intelligence.
St. AP   → 14  S    well God is the creation of all things,
            15  T    un-huh,
St. AP   → 16  S    (which all things) he made was good so then (the fact that)
                       intelligence being good all lead to the fact that um, (1)
                       being good and being, well he,
                       they says that he give upon us his inspiration ((unintelligible))
            17  T    un-huh
St. AP   → 18  S    you supposed to be smart, have knowledge,
                       (have knowledge) you really is born with,
Clarif.  → 19  T    how? how does God do that.
            20  S    now HOW he do that uh,
                       I really can't tell you but, i- it just this is (someth)
                       a belief that I have,
            21  T    un-huh
            22  S    you know from birth you know.
                       whether or not we're taught certain things,
                       there's some things we (just go and get) automatically,
            23  T    un-huh, un-huh,
            24  S    ((unintelligible phrase)) you know, like, take something like a
                       baby,
                       [you know
            25  T    [right
            26  S    certain things they just do, (you don't teach them)
                       ((unintelligible, trails off))
            27  T    do you think that everybody in your audience agrees, with you,
            28  S    probably not
            29  T    do you think that they understand, where you're coming from,
            30  S    understand,  y'mean, the belief of mi- the belief of GOD,
                       for those who know him yes,
                       but for those who probably never heard of him, no.
Final    → 31  T    what I'd like you to do then is to assume that you're writing
Recom.              to an audience that has never heard of God.
```

The teacher's global strategy is congruent with one of Tharp and Gallimore's proposed means of realizing assisted performance, the

instructional conversation (1988, p. 109, p. 111). It is also strongly reminiscent of the problem-solving practices observed by Rogoff (1990), who sees in such practices a principal way to socialize valued analytical faculties. A zone of proximal development is instantiated through the teacher's combined problem-solving topic frame and questioning strategy.

One of the most striking aspects of this segment is that while it at first resembles an everyday conversation, echoes of the default script resonate through it. The entire sequence can be likened to an extended IRE sequence, but one that *starts* rather than ends with the teacher's evaluation. As the student gradually warms to the teacher's repeated requests for elaboration, her contributions can be considered a lengthy reply move delivered across several turns. And by returning to the central point of audience-awareness in turn 27, the teacher harkens back to her opening evaluative move as she concludes with her final recommendation.

In terms of our second dimension, authorship, the segment is more distinct from the default script: The teacher exerts a strong shaping influence on the student's talk, but *does not author* R's revised position-statement. And yet, a fundamental paradox emerges even in this superficially more equal state of things: The student is given most of the responsibility, but little power over the task at hand. The event may emphasize the student's local authorship rights but only from within a series of prescriptive formulas about how to author, prefaced by the teacher's power-laden "what I'd like you to do . . .". Finally, the exchange also suggests that evaluations are a fundamental part of instructional discourse, a fact that many students are well aware of.[3]

Institutional Context

Our first instance of assisted performance occurred within a freshman writing program that had officially embraced conferencing, promoting it heavily in its staff orientation and training sessions. This produced an interesting paradox, because the ostensive student-centered nature of the program's curricular choices was counterbalanced by its larger institutional function.

The program itself, like many university writing programs, held something of an interstitial institutional position. While its service was invariably described as invaluable in public communications (such as the annual Dean's addresses to writing

instructors), that same service did not rate much staff or professional support. Serving a large undergraduate population, the program was run by only five permanent professionals and a few administrative assistants, with the entire instructional and supervisorial staff comprised of graduate students and an occasional part-time instructor, and was thus quite distinct from the university's academic departments in both make-up and level of material support. Its service orientation as a unit designed to socialize novice writers into the academic mainstream further subordinated the program to larger institutional oversight in matters of curriculum and self-definition.

The paradoxical nature of the program's reason for existence—to serve both its student body and its larger institutional host—parallels the contradictory nature of assisted performance as it arose during conferencing. The prescriptive formulas the teacher draws on to structure her student's performance in effect originate with the larger university, which is providing writing instruction in part to propagate its own academic standards. We thus find in the teacher's voice institutional motives which blend into the instructional exchange between teacher and student in structuring quite a distinct assisted performance—designed not so much to develop the student's writing voice, but to fashion that voice into a closer approximation of the institutional original.

Small Group Work

The second participant structure we examine—small group work (SGW)—is an instructional activity being employed with increasing frequency in educational settings from kindergartens to universities. Advocates of small group work (e.g., Cohen, 1986) or more generally, collaborative learning (e.g., Kagan, 1988) argue for organizing principles such as role assignments for each participant or a goal of reaching consensus among group members. In actual practice, however, group work is often structured with less rigorous parameters. In (2), for example, a group of beginning ESL learners (in a state funded adult school) were given a picture of the "Marlboro man" with instructions to "describe the picture" in the group.

The data of this excerpt corroborates Tharp and Gallimore's claim that students in small groups become adept at assisting one another's performance. In excerpt 2A, for example, Xiang assists

Maria by providing the words "snow" and "cover." Maria's appropriation of Xiang's assistance allows her to assume a more authoritative role in line 15, where she evaluates Xiang's repetition of her original proposition. In 2B, the discourse becomes more symmetrical, and assisted performance is coordinated as students verbalize their distributed knowledge to accomplish the task in an observably joint fashion.

(2A)   Small Group Work—Examples of student AP

		01	Maria:	Okay. uh it's a: (.) a view of the mountains,
		02	Xiang:	um humm=
		03	Maria:	=uh huh with- with ice with white
St. AP	→	04	Xiang:	the snow=
		05	Maria:	the snow (.) no ice
St. AP	→	06	Xiang:	=cover, the snow cover the mountains=
		07	Maria:	=the m- the snow cover the <u>mountain</u> ((pleased)) ahhh
		08	Xiang:	yeh yeh
		09	Wang:	perfect
		10	Sandy:	((laughs))
		11	Wang:	((laughs))
		12	Xiang:	the snow cover the mountains
		13	Maria:	((coughs)) (.) oh (guy)
		14	Wang:	the snow is uh (.) cover this mountain ah?
St. Eval	→	15	Maria:	uh-huh

(2B)   Small Group Work—Symmetrical AP

01	Xiang:	he wearing a:,
02	Maria:	hat
03	Xiang:	hat
		((several repetitions of "hat"))
04	Wang:	wearing with this th:: this uh brown:: uh [vest
05	Xiang:	[shirt
		and the brown [vest
06	Wang:	[brown vest [brown vest
07	Xiang:	[brown vest
08	Maria:	ah brown vest. he's wearing [a brown vest.
09	Wang:	[and a leather, (.)
		leather pants (.) leather (.) pants
10	Maria:	uh yeah a leather pants
11	All:	((laugh))
12	Wang:	a lea::ther, leather pants
13	Maria:	yeah

| 14 | Wang: | leather | [pants |
| 15 | Xiang: | | [a pair of leather pants |

The data further suggest that opportunities for teacher-assisted performance are maximized during SGW, as students frequently initiate such sequences by summoning the teacher for help. In (2C) below, for example, students are unable to generate the lexeme "saddle" and thus call for teacher assistance.

(2C)   Small Group Work—Summoning teacher assistance

		01	Wang:	this that
				this I seen this is uh:: board is a (.) beck
				. . . .
		02	Xiang:	beck back
		03	Maria:	uh huh
		04	Xiang:	horse back
		05	Wang:	horse chair
		06	Maria:	no the horse chair ((laughs)) (. .)
St requ.	→	07	Maria:	Jaynes ((calling to teacher)) could you help us please?
Tchr Ass	→	08	Tchr:	yeah it's called a saddle
		09	Ss:	((all repeat saddle several times))
2ns req.	→	10	Maria:	how you spell that?
Tchr Ass	→	11	Tchr:	((spells; students repeat letter by letter))
		12	Tchr:	exactly

Students here attempt to perform the assigned task of describing the picture, but between lines (01) and (06) realize they cannot. In (07), the teacher is summoned explicitly to assist their performance; her presence and verbal assistance leads students to practice the word's pronunciation in (09) and to pose a question (i.e., elicit further assistance) in (10).

In this environment, novices *initiate* episodes of expert assistance, a phenomenon which reappears in the Computer Lab and in the Video Class below. In other words, these settings allow the novice to direct or lead his or her own emerging assisted performance. Examples (2B) and (2C) also demonstrate the students' awareness of their own knowledge levels with respect to the task; that is, in (2B) they know that their collective knowledge is sufficient for the task, while in (2C) they recognize that it is not.

In demonstrating the kind of assistance available to students in (2), we are not advocating a particular type of group work.

What we wish to stress is that SGW, as typically practiced, can evoke both peer- and teacher-assisted performance and that simply and readily structured group activities can provide such opportunities for learning.

Institutional Setting

The adult school in which these sequences occurred differs from the other settings examined here in that it is publicly supported and does not serve a university-based population. And, while it represents a sizable enterprise within the state department of education, it serves the most marginalized population we address. Students are typically of working class backgrounds, in many instances undocumented immigrants. Classes are large (over 40 students) and often housed in elementary or high schools during off-hours.

In the present setting, this marginalized status becomes an opportunity for the classroom teacher to put into practice her belief in the regular use of group work. The teacher in this episode collected the transcript data for an ESL certificate requirement in sociolinguistics, focusing on group work as a matter of methodological preference. In her words,

> I maintain that small group activities are an excellent way to create a non-threatening, challenging practice for language acquisition . . . . As language facilitators and future teachers of ESL, I believe it is each teacher's responsibility to be aware of alternatives to the "traditional learning style." The most common discourse practice implemented within the C. School District is Teacher fronted or "lock step" method. It must be noted that although the lock step mode has its merits, small group arrangement is the more attractive alternative. (Eicher, 1990, p. 2)

In other words, the teacher's instructional choice in these data reflected her belief in SGW as an effective and positive teaching strategy, overriding the historic expectations of the wider activity setting. However, a contributing aspect of the wider setting is the extent to which the teacher controls the curriculum and

methodology of her class, in turn a reflection of the adult school's marginalized institutional status.

Class-Made Video

In the following segment, we again look to the classroom for discourse patterns that deviate from the default script. Example 3 below is taken from a beginning ESL class at a large private university. In this class (D in Figure 1), students were preparing to be videotaped while performing a skit they had previously written as part of a thematic unit on "crime."[4] Although this activity takes place in the whole class setting, it does so within a participant structure that evokes some striking changes in the discourse patterns of the default script. In the video class the teacher is seated with students, facing the group that occupies center stage. She thus assumes a role more akin to that of a coach or director, offering guidance and help from the sidelines. Here that help consists largely of providing needed forms of the target language. In the excerpts below, we again see assisted performance actualized as a natural outcome of doing the activity. In example (3A), where the student asks for help several times, the teacher provides the appropriate form which the student then incorporates into the dialog. In excerpt (3B), those previously coached utterances appear in the actual videotaped performance (indicated with →); in other words the teacher's assistance can be observed in both immediate and delayed contexts.

(3A)   Video-class: Rehearsal

　　　　　T: Teacher　　　S, J, K: Students

```
              01   S:  Hi. I'm a security- security. (2.0)
                        ((giggling from S, H, and J))
Tchr Ass → 02   T:  ((laughs)) S., you can ask what ha- what happened.=
              03   S:  =what happened,
              04   H:  somebody stealed uh (.6) my purse and my watch (.6)
                        and my ring. (2.6)
St requ.  → 05   S:  ((to T)) I want to ask where are you when the thief come
                        or like that.
Tchr Ass → 06   T:  where- [where were you
              07   H:          [(through the) window
Tchr Ass → 08   T:  where were you um you can say where were you when the
```

				thief came and H. you were gone- uh out
		09	S:	where were you (.8) =
		10	H:	uh
		11	S	=when the thief (come)
		12	H:	we are shopping. (1.2) we WENT shopping.
St requ.	→	13	S:	and what time ((looks at T)) do you leave your house?
				like,
Tchr Ass	→	14	T:	um-hmm:. what time DID you leave your house.
		15	J?:	(about) (half past) three (1.4)
		16	S:	(and what time) ((laughing)) (did you return) your house.
		17	H	(around) (about) eight o'clock (4.8)
		18	S:	((to T)) I uh I forget the question (before) (1.8)
				[I wi- I wi-
Tchr Ass	→	19	T:	[okay you can say UM: (.8) was the purse gone
				when you came home.

(3B)   Video-class: Filming

				((J opens door for S, the security guard))
		98	J:	[Hi
		99	S:	[I'm a security guard
				((X and S enter)) (3.8)
		01	S:	((to H)) hi
		02	H:	hi
Student	→	03	S:	what happened
appropriated				((door closes))
tchr-turn		04	H:	somebody stole my purse and watch. (1.6)
				I can't find (it). (2.6)
"	→	05	S:	are you in your hou- in your home when: the thief [come(s)
		06	H:	[no.
"	→	07	S:	(and in) what time did you leave your house. (1.0)
		08	H:	(a)bout three o'clock.
		09	S:	(1.0) what time did you come.
		10	H:	(about) seven. (2.8)
		11	?:	(hhh) (1.0)
		12	S:	okay. (.8) (you did not,) (.) see the thief?
		13	H:	no
		14	S:	okay I will check out (.4) maybe somebo- body (.4) saw him.

In terms of the distribution and organization of talk, the video lesson displays two fundamental differences from a typical teacher fronted script. First, in excerpt (3A) the teacher is not leading the interaction but following the lead of the student; there are no teacher-initiated IRE sequences. The second is the sheer attention given to student utterances in terms of discourse floor

space. Excerpt (3B), for example, is part of a 56-turn sequence of consecutive student turns—a phenomenon made possible by the video, which effectively closes off the opportunity for teacher contributions. Even in excerpt (3A), where the video is absent but anticipated, the participant structure allows students to dominate the discourse.

The video class represents a more specific and perhaps less widespread activity setting than the writing conferences and small group work. However, in terms of physical parameters it resembles a number of easily employable student-focused classroom activities such as role-plays, games, and debates. Such activities, if only temporarily, represent a form of "performance based education," which Elbow (1986) has argued allows teacher and students to become allies and assume a less adversarial stance toward one another.

Institutional Setting

The video class examined here was a regularly scheduled component of the ESL curriculum in this setting. That such a structure was possible can be related to several facets of the institutional context. Like many ESL programs attached to mainstream academic institutions, this one represented a marginalized unit within the university. It contributed heavily to institutional coffers, received little of its contributions in return, and was viewed as distinctly non-academic by the mainstream university community. In other words, like the freshman writing program above and the computer lab examined below, the ESL program represented an instructional context peripheral to the core academic concerns of the institution. Our contention is that such settings allow for more pedagogical innovation, and thus facilitate departures from the default script.

In the present setting the four teachers of the class were given virtual autonomy over the structure and content of the 24-hour weekly schedule. These teachers had been trained in and were vocal advocates of a communicative language teaching methodology which focused on collaborative and student-centered activities; moreover, their views were highly consistent with those of the English Language Institute. The decision to incorporate the video class was thus locally based, emerging from the teachers'

own educational ideologies and reflecting those of their immediate institutional context as well.

We argue that these characteristics of setting—peripheral institutional status, teacher and institutional commitment to communicative language teaching, and teacher-control over curriculum—make conditions in this class ripe for assisted performance episodes to occur.

Computer Lab

One of the most striking examples of AP we have observed is found in Patthey-Chavez's work on problem solving (Patthey, 1991). Motivated by a desire to find recognizable instructional discourse in a non-school setting, the study focused on a student computer lab at a large, private university offering unrestricted access to personal computer technology to any member of the university community. The lab served a self-selecting population working on self-selected tasks, with students (and other novices) generally assuming control over the technology put at their disposal. This led to an unending stream of problems with computing which was anticipated by the lab staff. To remediate these problems, the lab made available a corps of peer "Personal Computer Consultants" (PC consultants), whose daily praxis— consulting—yielded unschooled instructional discourse.

PC consultants defined their work as a service to lab users, especially student users. A professional ethos framed consulting events as user-initiated service encounters.[5] This service orientation towards consulting, combined with the peer status of the PC consultants, limited consultant authority over the cognitive activities of client-users. In stark contrast to most schooled instructional situations, in the lab, the acquisition of (additional) computer expertise was left to the novice. For the most part, it occurred as an incidental result of computer use, or rather, of its disruption, at which point novices usually sought out computer expertise—in the form of a consultant. As clients rather than students, users also determined what form that knowledge should take once a consultation was underway. If they involved themselves in the problem-solving process, they signaled tacit approval. Conversely, withholding involvement signaled disapproval and non-cooperation and could abort the entire problem-solving episode. Since neither party was particularly keen

on that outcome, problem-solving turned into an eminently negotiable affair.

Consulting displays a highly cooperative and complementary participant structure and a distinct instructional discourse. Consultants usually took the client's request for help as their starting point and tailored whatever solution they came up with to that request. They judged this to be the most appropriate strategy because varying clients perceived the "same" (technical) computer problem completely differently, and working solutions took these differing perceptions into account. The same wrong keystroke (e.g., hitting a wrong function key and getting a clear screen) had a different effect on an experienced user than on a neophyte. The former would have enough understanding of the function key system to know that a second key stroke could cancel the wrong move, whereas the latter might start panicking at an ostensive file loss. Experienced consultants knew how to exploit the greater systemic understanding of more knowledgeable clients, as well as how to guide neophytes towards a greater understanding of their mysterious machines, but required the cooperation of all clients in order to do a good job. Consultants and clients thus assumed alternating and complementing expert roles, which were reflected in the typical steps taken during a consultation: Clients were experts in problem-description and usually dominated the beginning of each session. Consultants were experts in drafting solutions, taking over control of conversation and action as the session progressed.

Segment (4A) below reveals the balance of power between clients and consultants resulting from these complementary participant roles. The client initially asks about a software program, *Microsoft Works*, unavailable in the lab. Upon being informed of this, the client persists by asking about possible alternatives. She redefines her service request four times until she stumbles onto a possible solution—converting her file to use another available software program. Of the eight initiations in this consultation-opening (starred and numbered below), seven are the client's, allowing her to persist in presenting and re-articulating her needs.

(4A)   From the Computer Lab: Perseverated Initiation

1a	01	C1	hi, um, can I have a microsoft works, do you have that?
1b*	02	PC1	works?
2b	03	C1	works, not word
2a	02	PC1	I DON'T have works
1c*	03	C1	you don't?
2c	04	PC1	no we don't have works
1d*	05	C1	you know where I can get works?
2d	06	PC1	um, no.
1e*	07	C1	at the freshman writing center?
2e	08	PC1	they [might] have it but I don't know
	09	GGP	[no] no they don't
1f*	10	C1	so what am I supposed to do if you don't have works
	11	GGP	um
2f	12	PC1	I don't know, because I, don't know anyone, anyone who has that program.
1g*	13	C1	okay. so we can't I can't convert it any way?
2g	14	PC1	yeah you CAN, you can use microsoft word and then save as, uu, microsoft one point o document which is in works format.
	15	C1	[and then]
	16	PC1	[you use microsoft] word, [and sa]
1h*	17	C1	[can you] come and help cause,
			((PC1 accedes to C1's request for help))

This one consultation-opening demonstrates how far clients can take their conversational power. What client C1 does above is not simply re-define her request each time she meets with an (to her) unsatisfactory answer.   In effect, her service-request redefinitions redefine *the event itself* four times. The consultation is geared to realize the client's agenda.   This gives the client licensing control over the way a consultation develops and s/he decides if a consultant response is satisfactory; once again, *the novice directs the expert.* This is most evident at the onset of consultations, but even once the consultant reasserts himself and talks the client through the various steps of a proposed solution, the client maintains her licensing right, as segment (4B), taken from later during the same consultation, shows below. As the consultant winds down his explanation of the conversion procedure, the client interjects the first of a series of clarification requests in turn 29. She is making sure that what he has explained applies to her particular situation, and that she won't find herself with an unworkable file later on.

(4B)   Computer lab: Clarification request

18	PC1	okay,
19	C1	okay
20	PC1	see you can do a file,
21	C2	oh yeah I just took it out
22	PC1	save as, it's okay.
23	C1	so you [could get]
24	PC1	[file format], right here, save as dot.
25	C1	oh I see,
26	PC1	and you hit okay and it'll save it like that, [okay,]
27	C1	[okay]
28	PC1	but if it's normal we'll just save like that.
29	C1	so if, when I use the computer I uh I usually use then I'll be on, um,
		it'll go back to be- to be-
		it will show up on my computer on microsoft works right?
30	PC1	yeah it will show up like this, sh- show up in this format.

The client will interject five more clarification requests before this one consultation ends and the consultant will attend to each and every one of them. In fact, Patthey-Chavez found that clients frequently exploited their licensing control to prolong consultations by asking for clarifications, transforming original requests, or adding new ones. They took full advantage of their directing authority.

In all the instructional discourse examined in this paper, consultations stand out sharply in this respect. There are no other cases in which the novice directs the expert to this extent, even in situations with a parallel one-on-one interactional design, like writing conferences. The computer lab was the one setting in our corpus where we found students truly engaged in discovery-learning, defining for themselves what to learn and when to learn it. It is also important to note that whether or not users understood or learned what the consultant had to offer was also left entirely to them. Patthey-Chavez found no explicit evaluation moves in her entire consulting corpus of 62 problem-solving interactions.[6]

The reasons for the extraordinary divergence represented by this degree of novice-control over learning and, by extension, over the expert's instructional discourse, must once again be sought in the larger institutional setting supporting consulting activity. The lab's mission was defined as providing assisted access to

technology to the campus community and consulting was explicitly provided as an extension of that mission. The specifics of computer-use were left to the client. The lab did not have any teaching mission other than enabling users to realize their own computing goals. In our other instructional encounters, specific instructional targets were often institutionally defined and these larger institutional motives influenced the structure as well as the course of instruction.

The consulting situation differs from other settings where experts (or teachers) retain final authority over the instructional agenda because they know what behavioral targets their students are to meet at the end of a given period of time (e.g., a semester). This situated expertise is acknowledged by students, who are (frequently) highly motivated to meet with institutional approval. In contrast, in the computer lab, the students ultimately control the parameters and goals of their own instruction.

DISCUSSION AND CONCLUSIONS

In the previous discussion, we have conflated Philips' (1983) construct of participant structure (PS) with Tharp and Gallimore's notion of assisted performance (AP) as a means of locating educational settings that can facilitate true discourses of learning. In particular, we have identified four participant structures which represent alternatives to the teacher-fronted format typical to most school settings, demonstrating the kinds of assisted performance which can occur within their bounds and how that discourse differs from the default script. Our concern has not been to advocate the particular structures and settings analyzed, but to identify dimensions of setting that allow for and encourage interactional sequences we could legitimately characterize as assisted performance.

A second goal has been to view each PS in light of its immediate and expanded context—in other words, to view the interactional sequences not only as the product of specific spatial and task arrangements, but as part of an overarching activity system (Engeström, 1987) in which individuals act within the constraints and influences of their co-present environments and broader institutional settings. Our effort has been to identify not

only the kinds of PS which can give rise to regularly occurring assisted performance, but also the broader dimensions of the activity context that allow the PS to occur and affect particular instantiations of assisted performance.

In examining these settings, several dimensions of context appear to have a critical impact on the nature of novice-expert interaction. Two inextricably related factors are 1) the personal ideologies of the participants and 2) the role of the instructional setting within its larger containing institution. For example, in the writing conference and video class, expert/teacher beliefs with respect to the nature of instruction were consistent with those of their immediate (but marginalized) organizational context. In the instance of the computer lab, the stated institutional goal could be paraphrased as one of assisted performance. In each of these settings, the conflation of organizational and individual beliefs resulted in contexts where alternate participant structures arose with some regularity—in the final instance reaching an institutionalized status. In the case of the adult school, neither the institutional nor the technological support allowing for the kinds of activities seen in the other three settings was available. However, the context's very marginalization allowed the teacher to instantiate her own beliefs with respect to collaborative learning, and thus regularly to structure activities that provided her students with opportunities for assisted performance. In this instance, an individual's ideology and her knowledge of alternatives helped transcend the expected and historical teacher-fronted structure; this turned out to be the crucial factor accounting for the emergence of assisted performance.

The Structuring of Asymmetry

Another pivotal factor affecting the organization of assisted performance in these data is the novice role in articulating or carrying out a given task agenda. The data suggest that a prominent novice role creates a greater likelihood that *novice-led* assisted performance will occur. Of the four alternate settings considered, assisted performance took such a novice-led form in all but the writing conference. Our point is not to devalue the writing conference vis-a-vis the other settings, nor to devalue teacher-led assisted performance, but to suggest that the overwhelming asymmetry of the writing conference contrasts with the more

autonomous novice role in the computer lab, video class and small work group. Each of these represents an instance where the novice either establishes or carries out the agenda and where as a result the novice initiates interactional sequences of AP.

Of the three settings, the computer lab is the sole context where the articulation of the agenda falls to the novice. We suggest that this dimension of computer lab interaction contributes to the lengthy and complex sequences of assisted performance that arise in the lab with such regularity. In the video class and small work group, the agenda is clearly the teacher's, but here the students are given a central role in carrying that agenda out. In such contexts the teacher, rather than leading students in the interactional instantiation of assisted performance, becomes available to assist as needed or when called upon.

In these activity settings, assisted performance and learning in the ZPD becomes novice rather than expert-led. We offer them as alternatives to the largely expert and teacher-led interpretations which have tended to dominate the ZPD literature and which represent the primary thrust of Tharp and Gallimore's definition of assisted performance. We propose, in other words, that both assisted performance and the ZPD be viewed as bi-directional phenomena in which novices not only influence but also direct sequences of learning. In terms of the Vygotskyan notion that instruction precedes and anticipates development, the present data suggest that in some settings the novice rather than the expert fulfills the role of anticipator, identifying and creating zones of proximal development. In such ZPDs, the expert is a necessary contributor, but not the one who identifies what is to be learned. This inclusive perspective, in combination with the Bakhtinian orientation we assume with regards to discourse and meaning, resolves an often noted problem with expert dominated accounts of learning within the ZPD—the problem of variation and creativity (Griffin & Cole, 1984). If what the zone makes available to the novice were monolithic, a relatively invariant transfer ought to result. That is hardly the case. Children and other novices (re)construct their own versions of the lessons given to them, they progress at their own rate, and they come up with creative new combinations. In the assisted performance/ZPD encounters examined above, we have documented how novices and multiple facets of institutional context can exert interactional influence. This range of influences preclude a monolithic transfer of

knowledge, pointing to the instigating role of the novice as well as to ways in which historical and institutional expectations are represented (or altered) in interactional encounters.   This multiplicity of factors constitutes the conditions which allow variation and creativity to occur, although these same factors may also constrain the interaction in a given novice-expert episode. The present study represents a step toward the empirical documentation of such phenomena.

NOTES

[1]   The order of the authors' names was determined by the flip of a coin. We are indebted to Ronald Gallimore for the thoughtful commentary on an earlier version of this paper.

[2]   This is a fact that merits serious discussion in its own right, though it does not form a core concern here. Our impression is that core educational institutions like elementary and middle schools showed a much greater uniformity in discourse practices than more marginalized educational endeavors like adult English as a Second Language classrooms.   This dichotomy was even reproduced within a larger institution like a university, where the core area of Freshman Writing evidenced a greater tendency towards what is effectively a hegemonic teacher-centered instructional style than the more marginalized ESL program.

[3]   One of the most striking findings of Ferris, Ferris, Hared, Kowall, and Patthey (1989) was that all high-achieving students in their sample persistently asked for very specific teacher feedback about how they were doing.   The consistency and specificity of these inquiries indicated to the investigators that part of these students' success lay in their command of this (self) evaluating strategy.

[4]   The curriculum of this course revolved around a series of thematic units deemed appropriate for beginning ESL students. These included such topics as family, home, transportation, and food.

[5] This ethos was elaborated and maintained by the corps as a vehicle for peer-socialization (cf. Patthey, 1991, Chapter 4).

[6]   Consultants did make an effort to explain problem-solving moves, and to draw clients into the process, but avoided follow-up comprehension checks beyond requests for confirmation (Patthey, 1991, Chapters 5 & 7). Novices were oriented by consultants to attribute the success or failure of a given solution to the computer. Unexpected or unsatisfactory results were represented in such a way that the computer or another part of the technology—for "its own" mysterious and unfathomable reasons—conveniently absorbed most of the blame, allowing both participants to save face.

Segment (5) presents a particularly clear example of this strategy. A non-native speaker, C7, whose limited English proficiency presents a true challenge to consultant PCS, has a disk-error fixed. PCS then tries to explain what was wrong with the diskette, meeting with only limited success.   When the client follows up with a further clarification-request (turn 10), PCS falls back on the "irrational computer explanation" to conclude his efforts (turn 11):

01	PCS	right here,
02	C7	um-hm
03	PCS	this is your paper,
04	C7	um-hm
05	PCS	that says that that's the end of your file,
		so that's how it reads,
		(wha) I do is get in there, to change it.
06	C7	so this is, mat- metal file, zero file and this,
		paper, [I think
07	PCS	well [this is, this is your file
08	C7	yeah
09	PCS	this is the,
		the section that, your disk thinks is your file,
		but the first thing it reads, is an end of file,
		so it won't show you anything after that
10	C7	oh, ((quietly))
		(3)
		how it happen, cause I can print out from the diskettes now.
11	PCS	it's just sometimes it hits it and sometimes it doesn't

This kind of "blame the technology" explanation of a problem's origin or development was common with consultants, and it was also used by clients, usually to similar effects.

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Deborah Poole is Associate Professor of Linguistics in the Department of Rhetoric and Writing Studies and the Department of Linguistics and Oriental Languages at San Diego State University. She is an applied linguist with a special interest in classroom language use.

G. Genevieve Patthey-Chavez is an Applied Linguist with the Sociobehavioral Group at UCLA and Institutional Researcher at Los Angeles City College. She is interested in all aspects of the interface between activity, language, and cognition.

APPENDIX A: TRANSCRIPTION CONVENTIONS

[	Overlapping utterances
=	Contiguous utterances
-	Self-interruption, cut-off
?	High rising intonation, questioning contour
,	Low rising intonation, continuation contour
;	Level intonation, completion contour
.	Falling intonation, closure contour
WORD	Increased volume
<u>word</u>	Stressed speech
wo:rd	Lengthened or stretched vowel
(word)	Transcriber doubt
( )	Unintelligible utterance
(1.2)	Timed pause (in tenths of a second)
(.)	Untimed pause (in quarter-seconds)
(( ))	Contextual information
. . .	Deleted word(s)

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A Statistical Analysis of English Double Object Alternation

Robert S. Williams
University of California, Los Angeles

This paper explores the phenomenon of post verbal alternation in English double object constructions, and presents a statistical model for predicting the position of the indirect object in instances where alternation is unconstrained (e.g. "Roger gave us the clothes," vs. "Roger gave the clothes to us."). Analysis covers a large set of written and oral American English data using a parametric multiple regression instrument to establish the relationship of a set of grammatical and discourse variables to a binary dependent variable, in this case the post-verbal position of the indirect object.

INTRODUCTION

Alternation in English double object argument constructions raises an interesting set of questions for linguists, including those concerning constraints and influence on alternation. Questions of grammatical constraints on alternation are important to an overall understanding of double object constructions and there is much in the literature on morphological, phonological and syntactic constraints on alternation (Groppen, Pinker, Hollander, Goldenberg, Wilson, 1989; Mazurkewich & White, 1984; Oehrle, 1976 and others). This study addresses the narrower question of whether or not double object alternation, when unconstrained, is predictable. That both versions of most double object constructions (1a and b) are equally acceptable to most native speakers of English, even out of context, suggests that perhaps alternation in double object constructions is optional.

> (1) a. Roger gave the clothes to us.
>   b. Roger gave us the clothes.

However, there is evidence from previous studies (Halliday, 1970; Smyth, Prideaux & Hogan, 1979; Erteschik-Shir, 1979; Thompson, 1987; Williams, 1989; and others) that double object alternation is influenced by grammatical and discourse properties of the double object constituents themselves. Of these, the studies by Thompson (1987) and Williams (1989) examine large corpora of data and offer predictive models for the order of double object constituents.

This study differs from previous ones in two important ways. First, it presents a statistical model which predicts the position of the indirect object by taking into account a set of syntactic, lexical, and discourse variables associated with it, and second, it finds variables not considered in previous studies to be influential in determining the position of the indirect object.

THEMATIC ROLES OF POST-VERBAL ARGUMENTS

For the purpose of this study, the terms *theme* (T) and *goal* (G) will be used instead of direct object and indirect object, respectively. These terms reflect the thematic role of the arguments, and their use avoids a host of problems, including the word order related problem of using the term *indirect object* when this argument appears in the immediate post-verbal position without a preposition. The definitions of the terms *theme* and *goal* as used in this study are taken from the Thematic Relations Hypothesis (Gruber, 1976; Jackendoff, 1972, 1978, 1983), whereby, in the case of double object constructions, *theme* refers to a concrete or abstract entity which undergoes a change of position or state as defined by the *goal*, which is the recipient or target of the *theme*. So in the case of (1a), the object physically changes position, whereas in (2)

(2) Richard told John a story.

the theme is transferred to an abstract place, in this case John's mind.

BACKGROUND

The notion that double object alternation is not optional but rather influenced in some way at the sentential and/or discourse level is not new. Smyth, Prideaux and Hogan (1979) noted that the relative order of the two objects in a double object construction is governed by preceding context. In this study, post-verbal word order is said to be either contextually motivated or contextually unmotivated. Word order is contextually motivated when "..the use of that device is based on the fulfillment of expectations developed in the context" (1979, p. 29). So, in answering the question "Who did you give the book to?", the word order in (3)

(3) I gave the book to Moses.

can be said to be contextually motivated, since it places the indirect object in the end or 'prominent' position in order to fulfill the expectations raised by the preceding question. The word order in (4), however,

(4) I poured myself some wine, then passed the bottle to Wayne.

can be said to be contextually unmotivated, since there are no expectations set in the preceding context which cause the indirect object to be placed in the end or 'prominent' position.

According to Smyth, et al. (1976), when post-verbal word order is contextually motivated, then that word order is constrained by a 'given-new' distinction (Halliday, 1967, 1968; Chafe, 1970, 1972, 1974, 1976, 1987). This distinction is based upon what the speaker assumes to be in the hearer's consciousness at the time of the utterance. If an element is assumed by the speaker to be in the hearer's consciousness, then it is 'given' information; if it is not, then it can be classified as 'new' information. Thus in a double object construction where word order is contextually motivated, a constituent that is 'new' will occupy the end position and one that is 'given' will occupy the immediate post-verbal position. In double object sentences where word order is contextually unmotivated, word order is unconstrained and optional. Smyth et al. tested this

theory using a recognition memory task and found their subjects to be "sensitive to changes in dative position in motivating contexts but not in nonmotivating contexts" (1976, p. 27).

Erteschik-Shir (1979) defines the discourse function of double object alternation in terms of a principle of dominance, according to which the sentence-final position is reserved for dominant material. According to the author, an element in a sentence is considered dominant if the speaker's intention in uttering the sentence is to direct the hearer's attention to the intension, or syntactic content, of that particular element. This principle is distinguished from other information flow theories, such as 'given-new information' (Chafe, 1976) and communicative dynamism (CD) (Firbas, 1974) by the fact that dominance is seen as an absolute property whereas 'given-new' and CD are relative properties. Accordingly, there can be no opposition between the relative dominance of two object constituents; a constituent is either dominant in a given sentence or it is not. Further, Erteschik-Shir proposed a hierarchy of determiners, wherein indefinites (indefinite or ø article) are said to indicate that an element is dominant, and definites (definite articles, possessive determiners, pronouns, etc.) usually indicate that an object constituent is nondominant. It is possible, however, for a definite NP to be interpreted as dominant, and the addition of a relative clause giving additional information about the definite noun will be even more easily interpreted as being dominant. This coincides with the so called "heavy NP shift" transformation, whereby a "heavy" or "lengthy" NP will be moved to the sentence final position, and thus interpreted as being dominant. According to this hierarchy, pronouns can be used dominantly only when they are meant to be interpreted contrastively. In accordance with research mentioned above, Erteschik-Shir believes that the pronoun *it* can never be used dominantly, that is, appear in the end position. According to Erteschik-Shir, then, the function of double object alternation is to "force a dominant interpretation of the NP that ends up in final position" (1976, p. 451).

In a more recent study, Thompson (1988) looks at double object alternation from a different perspective. Thompson's study focuses on constituents which possess a cluster of "topicworthy" grammatical and discourse properties and their relationship to the immediate post-verbal position in a double object construction.

These properties - *animacy, pronominality, specificity, identifiability, proper nounhood, length and givenness* - are identical to those most often found in grammatical subjects in English sentences which, according to Thompson, are the "grammaticization of discourse topics" (1987, p.3). Thus the designation topicworthy.

Thompson's database consisted of 196 clauses where indirect object movement was allowed. She coded each indirect object and direct object for the dependent variable *position* (either immediate "post-verbal" or "end"), and for the presence and degree of the independent topicworthy variables mentioned in the previous paragraph. Thompson found that Gs were more likely than Ts to have topicworthy properties and that Gs in the immediate post-verbal position were more likely to have topicworthy properties than Gs in the end position. She therefore concluded that 1) non-subject topicworthy arguments in English are more likely to occupy the immediate post-verbal position and that "where there is competition for this position, the more topicworthy argument wins" (1987, p. 2, p. 4) indirect object movement is not an optional operation but is instead determined by the speaker's need to manage information flow.

THE PRESENT STUDY

The present study owes much to Thompson (1987) in its basic construction in that it is also concerned with topicworthiness and the non-subject topic position as defined in therein. However, in the analysis which follows, the list of possible topicworthy properties has been expanded. In addition, and most importantly, this study includes a statistical model which identifies and uses topicworthy independent variables to predict the position of G in a given double object construction.

There are eight independent variables examined in this study which were chosen because they were either hypothesized or found in previous studies to have a relationship to the post-verbal order of the constituents in double object constructions. These are: *syntactic class of the verb (transitive/intransitive), register (formal/informal), modality (written/oral), givenness, prosodic length of G versus T,*

definiteness of G, animacy of G, and *specificity of G.* The variables *syntactic class of the verb, register*, and *modality*, though different from the other variables in that they are not actual properties of G, were added to the present study because they were found in a previous study (Williams, 1989) to have some relation to the position of G. It is hypothesized, based upon previous studies, that the variables ditransitive verbal syntactic class, informal register, oral discourse mode as well as the properties in G of givenness, prosodic length shorter than that of T, definiteness, animacy and specificity will influence the likelihood of G being in the immediate post-verbal position.

Data Base

In selecting the corpus used in this study, it was my intention to collect as representative a sample as possible of American English speech and writing. For that reason, an attempt was made to construct a corpus reflecting the diversity of gender, class, race and region which make up the native English speaking American populace. The data base was taken from four different genres of spoken discourse and eight different genres of written discourse. The spoken discourse consisted of oral history (two sources), congressional hearings (transcripts of the Watergate hearings), and two genres taken from the UCLA Oral Corpus: classroom dialog and advice giving (transcripts from three radio call-in talk shows). The written discourse in the data base was taken from the genres of biography, fiction, inter-office electronic communication, news magazines, newspapers, non-fiction, academic writing and sports writing.

Methods

Tokens of double object constructions were extracted from each source, yielding a total of 168 (74 from the written discourse and 94 from the spoken). Of these, 149 tokens were dative and 19 were benefactive. Eliciting verbs, the most frequently used of which is *ask,* usually take the preposition *of.* However, if T is a clause, such as in the sentence

(5) John asked us if we could come an hour early,

T must appear in the end position. Since only one instance (6) of an eliciting verb allowing all three positions occurred in the data, this type of verb will not be considered in this study.

(6) Diane asked her new friend a question.

Only sentences allowing double object alternation were used in the study. Thus, sentences such as those in (7) or (8) were not considered.

(7) a. The shirt cost me ten dollars.
    b. *The shirt cost ten dollars to me.

(8) a. Mr. Johnson explained the situation to us.
    b. *Mr. Johnson explained us the situation.

The sentences used in the study were coded for the dependent variable position of G (either post-verbal or end), and the independent variables syntactic class of the verb, register, modality, animacy of G, definiteness of G, specificity of G, prosodic length of G versus T, and givenness of G. The data were then analyzed for the relationship of the independent variables to the position of G, using The Logistic Procedure (SAS Institute, 1985), a parametric multiple regression instrument. This procedure was used rather than a Chi-square or multiple regression procedure because it alone allows for the testing of the relationship of a large number of independent variables to a dichotomous dependent variable.

Statistical Procedure

Using statistical tests on any natural language data is problematic because the argument can be made that data from individual speakers violate the assumption of independence required by most tests. In order to make these data more independent, an aggregate data set was created from the original data (n=168) by collapsing tokens from speakers contributing more than one token. This was accomplished by computing a within-speaker mean for the variable prosodic length of G and a within-speaker mode for all other variables. The aggregate tokens were added to data from

speakers producing single tokens, resulting in a data set (n=59) consisting of one token per speaker, hereafter referred to as the aggregate data set. Since the statistical instrument was only applied to the collapsed data, all percentages resulting from the statistical test or taken from the raw data will refer to the collapsed data unless otherwise specified. All examples and counterexamples used in discussing the results or for clarification purposes are taken from the original data set.

Data were analyzed using The Logistic Procedure (op. cite), a parametric multiple regression instrument which is unlike other regression tests in two ways. First, it allows for a dichotomous dependent variable, and second, the results are computed in terms of a Chi-square statistic rather than correlation and r^2. The Logistic Procedure (op. cite) uses maximum likelihood procedures to examine the relationship between the response probability of the dependent variable, in this case the position of G, and the independent variables.   In this instance, the procedure was programmed to identify and enter only the most powerful independent variables into a stepwise equation, entering the most powerful variable first. If the first variable entered achieves a level of significance (for this study $\alpha=.05$), it can be said to be independently significant in its relationship to the dependent variable. All subsequently entered variables reaching the .05 level, however, are only significant as members of the larger set of independent variables.   As with Chi-square and regression procedures, the fact that a variable reaches the significance level of .05% does not imply causality. What it does imply is that there is a statistically significant relationship between a dependent variable and a group of independent variables, thus providing a predictive model, in this study for the position of G.

Variables

The following variables were entered into the model.

Syntactic Class of Verb

This variable is used to explore the relationship between transitive verbs, such as *read*, which subcategorize for only one

object but which may take two objects and ditransitive verbs, such as *give,* which subcategorize for two objects.

Register

In placing the different genres into formal and informal categories, all spoken discourse was considered to be less formal than the written discourse. For the purpose of this analysis, all genres of written discourse in this study were considered formal. Within the spoken discourse, the data from the Watergate hearings were considered to be formal spoken discourse, whereas all other genres were considered informal. The Watergate data were then combined with the written data to constitute the formal category, while the remainder of the spoken discourse formed the informal category.

Modality

This variable is included to examine the possible effect of written versus oral discourse on the position of G.

Givenness of G

Givenness is defined here as the degree to which the speaker/writer presupposes an element to be in the hearer/reader's consciousness at the time of the utterance (Chafe, 1987) This is obviously difficult to gauge. The concept of referential distance (Givón, 1983; Chen, 1986) will be used to determine givenness. Referential distance is determined by the distance in clauses from the object constituent to its last referent in the preceding discourse. This also takes into account the principle of entailment, which is based on schema theory (Bartlett, 1932; Tannen, 1979). Within the framework of this theory, a schema can be defined as a "...cluster of interrelated expectations" (Chafe, 1986, p. 29). Once a schema has been invoked in a narrative, then all of the expectations that constitute the schema can be accorded some degree of givenness as well. Accordingly, the schema *house* entails such expectations as *window, door, room,* etc. If, for example, an object constituent is window, and it has no previous mention in the discourse, but *house* does, then its referential distance will be calculated from the last

mention of *house*. This kind of entailment will be referred to as lexical entailment . Moreover, there are certain cases where a word can be said to be given by entailment, even if there is no direct lexical entailment in the previous discourse. In sentence (9)

(9) If you find the book, send it to me

me can be said to be given, because the hearer is aware that he is being spoken to and will have no problem in knowing that *me* refers to the speaker. "First and second person referents acquire the given status naturally from the conversational context itself" (Chafe, 1974, pp. 123-124). This kind of entailment will be referred to as contextual entailment.

Prosodic Length of G vs. T

This is a dichotomous variable where G either has a prosodic length which is less than or equal to T, or is greater than T. In computing prosodic length, all determiners and modifiers are counted along with G. For the purpose of this study, prosodic length is measured according to moraic theory (Hyman, 1985).

Mora (symbolized by the lower case Greek letter Mu (μ)) are units of prosodic weight which are projected from syllabic nuclei and coda. Onsets are considered to have no weight and thus project no mora. English syllables may consist of one mora, where the syllable has the shape (C)(C)V, or two mora, in the case of syllables with either the shape (C)(C)VV (diphthong) or (C)(C)VC(C). No syllable can have more than two mora. In the case of

(10) David gave Cynthia a large black dog

G would have the moraic structure in (11) and T that of (12).

(11)   Cyn.thi.a   (12)   a large black dog

Therefore in (10), G has slightly more than half the prosodic length of T, but since this variable is considered dichotomous, it is only important that G is less than or equal to T.

Definiteness of G

Definiteness is defined by the type of determiner used with G. Constituents with demonstrative pronouns, definite articles, and possessives as determiners as well as proper nouns and pronouns were considered definite, whereas constituents with an indefinite article determiner, a cardinal number determiner or an indefinite quantifier (e.g., a few, many, several) were considered indefinite.

Animacy of G

Animacy is treated as a dichotomous variable, with humans, animals, and entities made up of humans (e.g., company, government, team) being considered as animate. There were, however, no tokens in the data where G was an animal.

Specificity of G

A constituent is considered to be specific unless it has no referent or refers to a class of entities. For example, in the sentence *Teachers give boys a lot of attention,* the G *boys* is considered non-specific.

ANALYSIS

The Post-Verbal + Preposition

Typically, only the post-verbal and end positions have been listed as possibilities for double object alternation. It is possible, though, to have a sentence such as

(15) Eisenhower...forwarded [$_G$to each of them] [$_T$a formal Letter of Appreciation.]

Since, however, the occurrence of G in this position was not found in the present data, it is impossible to determine the probable cause of G being in this position. In a similar previous study using data taken from written discourse (Williams, 1988), only three instances of G in this position were found. The fact that sentences such as (15) are so rare could indicate that this position for G is a stylistic option found mainly in written discourse and is not strictly rule-governed. For these reasons, subsequent discussion will concern only the immediate post-verbal and end positions for G.

Characteristics of the Data

The distributive characteristics for individual variables in both the original and aggregate data sets are presented below in Tables 1 - 9.

Table 1: Distributional Characteristics of Position (%)

Position of G	Immediate P-V	End
Original	65	35
Aggregate	73	27

Table 2: Distributional Characteristics of Mode (%)

Mode of G	Oral	Written
Original	57	43
Aggregate	47	53

Table 3: Distributional Characteristics of Syntactic Type (%)

Syntactic Type of G	Transitive	Ditransitive
Original	38	62
Aggregate	39	61

Table 4: Distributional Characteristics of Register (%)

Register of G	Informal	Formal
Original	56	44
Aggregate	53	47

Table 5: Distributional Characteristics of Givenness (%)

Givenness of G	Entailment	0-1 Clause	2-4 Clauses	>5 Clauses
Original	47	19	3	31
Aggregate	54	15	2	29

Table 6: Distributional Characteristics of Length of G vs. T (%)

Lgt of G vs.T	G<T	G>T
Original	77	23
Aggregate	83	17

Table 7: Distributional Characteristics of Definiteness (%)

Definiteness	(+) Definite	(-) Definite
Original	89	11
Aggregate	98	2

Table 8: Distributional Characteristics of Animacy (%)

Animacy of G	(+) Animate	(-) Animate
Original	93	7
Aggregate	97	3

Table 9: Specificity (%)

Specificity of G	(+) Specific	(-) Specific
Original	94	6
Aggregate	100	0

With the exception of the variable mode, which is in inverse proportion in the original and aggregate data sets, all other variables are of roughly the same proportions in both data sets, though Specificity is somewhat problematic in the aggregate data set since it indicates that all Gs are specific, which is not in fact the case. The variables Animacy and Definiteness are also problematic, since, as with Specificity, a very high percentage of Gs are (+) animate and (+) definite. This fact makes a statistical analysis of the relationship between these three variables and the position of G difficult since a high percentage of Gs in both the immediate post-verbal and end positions are likely to be animate, definite and specific. Because of the disproportionate distributional characteristics of these variables, especially in the aggregate data set, Definiteness, Animacy, and Specificity were not entered into the regression equation.

RESULTS

Results do not support the hypothesis that all independent variables in the study, taken as a group, are predictors of the position of G. However, three of the independent variables were found to have a significant relationship to the position of G: prosodic length of G vs. T ($p > 0.0001$), syntactic class of verb ($p > 0.0047$), and register ($p > 0.0212$). The variable prosodic length of G vs. T, where G was shorter than T, was found to have the strongest relationship and, since it was entered into the equation first, can be said to be individually significant. The variables syntactic class of verb (ditransitive) and register (informal) are only significant as members of the group of three significant variables. No other variables reached the level of significance needed for entry into the model.

DISCUSSION

In the case of givenness the data neither support the initial hypothesis of this study nor the information flow theories of Chafe

(1976) or Erteschik-Shir (1979), since givenness did not reach the threshold of significance for entry into the model.

Table 10:   Givenness

Position of G:	Immediate P-V	End
Givenness of G:		
Entailment	27 (84%)	5 (16%)
0-1 clause	8 (89%)	1 (11%)
2-4 clauses	1 (100%)	0 (0%)
>5 clauses	7 (41%)	10 (59%)

Considering the percentages in Table 10, it is clear that Gs which contain given information (from entailment up to 4 clauses) are much more likely to occupy the immediate post-verbal position than the end position. However, it is possible that givenness was not found to be significant because there is a high percentage of Gs which contain information that is not given (> 5 clauses) also occupy the immediate post-verbal position.

It is possible, though, that givenness and dominance do influence double object alternation in that they are not unrelated to prosodic length. It could be argued that whatever constituent the speaker intends to be dominant would be modified more than a non-dominant constituent and thus would be longer in terms of prosodic length. Likewise, new, as opposed to given, information would also require greater modification. The data show, in fact, that G contains given information and is shorter than T in 58% of the cases.

Prosodic Length of G vs. T

From the raw data (Table 11), this variable appears to have the strongest relation to the position of G of the three, and as mentioned previously, is the only variable found to have a relationship to the position of G independent from the other two variables in the significant group. G is in the post-verbal position 84% of the time when G is shorter in prosodic length than T. Conversely, G is much more likely to occupy the end position when it is greater in prosodic length than T (80%).

Table 11:   Prosodic Length of G vs. T
and the Position of G

Position of G:	Immediate P-V	End
Lgt of G vs. T:		
G<T	41 (84%)	8 (16%)
G>T	2 (20%)	8 (80%)

There are no instances in the data set where G is in the post-verbal position and none of the significant predictors are present. The fact that two or three predictors are present in 93% of such cases underscores the statistical finding that a cluster of properties is necessary for predictability. Of the eight cases in the original data where G is in the post-verbal position and only one predictor is present, greater prosodic length in G accounts for six examples, which supports its tendency to be primary among predictors. There is another kind of possible counter-example. Where G is in the end position in informal discourse, where the example has a ditransitive verb, and where G is shorter in prosodic length than T, we would expect it to occupy the immediate post-verbal position, which is the case in all but two instances in the data, shown in the following examples.

(14)   He pulled out this cellophane packet and handed it to me, and there was his hair in it.

(15)   We took home the 45 and worked on our own arrangement, two vocals and a piano in Jan's garage, and we gave the tape to Lou.

In (14), the presence of pronominal T seems to prohibit G from appearing in the post-verbal position. The second counter-example is interesting because all three predictors are present but G is in the end position. However, I am not claiming that this model can predict 100% of variability and it is beyond the scope of this study to identify the amount of variation predicted, so counter-examples such as (15) should not be unexpected. What is unexpected is that there are not more of them in the data, a fact that is possibly unique to this data set and perhaps not indicative of other data. In any case, there is obviously room for the individual speaker

to manipulate double object alternation for reasons other than those accounted for in the present study. Thus, speakers could intentionally choose one order over another to focus on differences in meaning. For example, some speakers perceive a difference in meaning in the following sentences which could motivate choice of order.

> (16) a. He got the papers to the President early Monday
>   morning.
>   b. He got the President the papers early Monday
>   morning.

Syntactic Class of Verb

The results support the hypothesis that the domain of a ditransitive verb has a relationship to position of G, though only in conjunction with the other two significant independent variables. In particular, the results show that in double object sentences where the verb is ditransitive, G is likely to be in the immediate post-verbal position (83%). The raw data suggest that the domain of a transitive verb also seems to be related to the immediate post-verbal positioning of G, though somewhat less than a ditransitive domain.

Table 12: Syntactic Class of Verb and the Position of G

Position of G:	Immediate P-V	End
Syntactic Class:		
Transitive	13 (56%)	10 (44%)
Ditransitive	30 (83%)	6 (17%)

Of 22 cases in the data set where there is a ditransitive verb and G in the end position, 19 of these involve G being longer than T, as in example (17), again underscoring the primacy of prosodic length among predictor variables.

> (17) Irish quarterback Tony Rice had just handed the
>   ball to fullback Anthony Johnson.

However, syntactic class and length cannot explain all of the examples in the data. The following three counter-examples (18,

19, and 20) are cases where G is in the end position with a ditransitive verb and is either shorter in prosodic length than T or where G and T are of equal length.

> (18)   Now you say that you then prepared a political matters memorandum for Mr. Haldeman.

> (19)   I did take the responsibility - have the responsibility, for getting the materials to the President for making decisions.

> (20)   For example, when Estelle T. Griswold and Dr. C. Lee Buxton were convicted in Connecticut of giving birth control advice to persons in violation of that state's anti birth control statute.

All three sentences, however, are examples of formal discourse.

Register

The results show that informal discourse setting is significantly related to G being in the immediate post-verbal position and, taken with syntactic class and prosodic length of G vs. T, is a predictor of the position of G. In an informal discourse setting, G is in the immediate post-verbal position in approximately 80% of tokens (Table 13). However, where the discourse setting is formal, G occupies this position in 64% of the tokens, underscoring the status of register as the weakest of the three predicting variables.

Table 13:   Register and the Position of G

Position of G:	Immediate P-V	End
Discourse Set:		
Informal	25 (81%)	6 (19%)
Formal	18 (64%)	10 (36%)

Had formal and informal registers been defined differently, for example in context with the relative social status of the speakers, the results may have been very different. This will be a point of further research as the model is refined.

CONCLUSIONS

Analysis of a large data base of written and spoken American English failed to confirm the hypothesis that the variables ditransitive verbal syntactic class, informal register, oral discourse mode, as well as the properties in G of givenness, prosodic length shorter than that of T, definiteness, animacy, and specificity are predictors of the position of G in a double object argument. The analysis did find that the variables prosodic length of G vs. T, syntactic class of verb, and register, when considered as a cluster, are predictors of the position of G. The specific variable settings found to be significant are prosodic length of $G < T$, ditransitive syntactic class, and informal register. Further, the variable prosodic length of G vs. T was found to be the most powerful as well as the only variable to be individually significant. Though the definition and coding of the independent variables could be questioned, a statistical model which is able to predict the post-verbal order of constituents in a double object construction has been presented. Further research is needed to refine the model; future studies could utilize alternate definitions of the independent variables (e.g., register, givenness) used in this study or focus on other possible independent variables.

NOTE

[1] For the purpose of clarity, I have used my G and T terminology in discussing Thompson's study. However, Thompson uses the terms R (recipient) for indirect objects and P (patient) for direct objects.

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Robert S. Williams is a doctoral candidate in the Department of TESL/Applied Linguistics at the University of California, Los Angeles. His areas of research interest include language obsolescence, phonology, American Indian linguistics and language policy, and pragmatics. He is a member of Chickasaw Nation of Oklahoma and has been active for many years in various aspects of American Indian language revival and maintenance, including the application of ESL methodology to the teaching of American Indian languages.

English Dative Alternation and Evidence for a Thematic Strategy in Adult SLA

William D. Davies
University of Iowa

INTRODUCTION

A body of recent work in second language acquisition is concerned with applying constructs from Chomsky's conception of Universal Grammar in both constructing an overall theory of SLA and explaining various phenomena in L2 learners (e.g., Flynn, 1984, 1987; Hilles, 1986; Phinney, 1987; White, 1985a, 1985b; papers in Flynn and O'Neil, 1988). A key linguistic construct that has received relatively little attention in SLA research is thematic roles—notions such as AGENT, THEME, GOAL, LOCATION, SOURCE, and others that are believed to contribute to semantic encoding and decoding. Although thematic roles (alternatively, thematic relations, semantic roles, case roles, θ-roles) have long been part of modern linguistic theory (cf. Gruber, 1965; Fillmore, 1968; Jackendoff, 1972), they have enjoyed increased popularity in the recent linguistic literature owing in part to their central role in Chomsky's (1981) government and binding (GB) theory, as embodied in the θ-Criterion.[1]

Various formulations of the θ-Criterion have been proposed, but the simple formulation in (1) will suffice here.

> (1) **θ-Criterion** (Chomsky 1981, p. 36):
> Each argument bears one and only one H-role, and each H-role is assigned to one and only one argument.

A set of thematic roles is associated with a verb in its lexical entry, and these thematic roles are assigned by the verb to its complements (i.e., subcategorized arguments) and to the subject of the sentence

(through the combined meaning of the verb and its complements in GB theory).[2] Thematic roles thus can be taken to be lexical properties of verbs. The θ-Criterion, in conjunction with the Projection Principle, is intended to tightly constrain syntactic structures, these structures in large measure being projections of the lexical properties of verbs. If much of grammar rests on lexical properties, as Chomsky currently hypothesizes, and if language acquisition (relating to sentence grammar) to a large degree involves learning various lexical items, then thematic properties of verbs could play a discernible role in L2 acquisition. As an adult learner presumably approaches an L2 with a set of thematic roles intact,[3] aside from perhaps some (minor) adjustments for thematic differences in perceived L1-L2 corresponding predicates, one important task for the learner is most likely associating syntactic structures with various verbs, mediated by the thematic structure of those verbs.

Additionally, some research has identified thematic roles as important entities in language processing and first language acquisition. In a series of articles, Carlson and Tanenhaus (Carlson & Tanenhaus, 1988; Tanenhaus & Carlson, 1988) provide experimental evidence suggesting that thematic roles play a central role in language comprehension by providing a mechanism for making on-line semantic assignments and a mechanism for the interaction of various processing components (e.g., syntax, discourse structure, real-world knowledge). Various researchers (e.g., Grimshaw, 1981; Macnamara, 1982; Pinker, 1984) have proposed that semantics, and in particular thematic roles, contribute to the formation of the syntactic categories necessary for first language acquisition. Thus, thematic roles figure prominently in both theoretical and experimental work in the formal study of language.

Despite the centrality of thematic roles to GB theory, the SLA research alluded to above has concentrated primarily on purely syntactic principles, constructs such as subjacency, null subjects, branching direction, and so forth. The aim of this study is to suggest that thematic roles may constitute an important factor in SLA in the assignment of syntactic structures. In particular, results from a pilot study suggest that some L2 learners may use a thematic strategy when making acceptability judgments regarding the English dative construction. The evidence suggests that learners using this thematic strategy crosscut L1s and ability levels. Such results open

a new area of inquiry in SLA and point to another potential commonality with some views of L1 acquisition: the thematic strategy embodied in the semantic bootstrapping hypothesis (Pinker, 1984).

In the section below, English dative alternation and a current approach to its distribution is discussed. In the sections which follow, non-native speaker judgments are collected and analyzed; the thematic strategy apparent in the responses of some subjects is then outlined and discussed.

ENGLISH DATIVE ALTERNATION

The object of inquiry is non-native speaker judgments of the acceptability of a range of dative constructions in English. Of particular interest is the general productivity of the so-called "dative alternation," as exemplified in the pair of sentences in (2).

(2) a. John gave the book to Mary.
b. John gave Mary the book.

Many "dative" verbs such as *give* subcategorize either for an NP direct object and a PP indirect object (2a), what I will refer to as the "prepositional structure," or for an NP indirect object and an NP direct object (2b), the "double object structure." As is well-known, the dative alternation in (2), while widespread, is subject to certain conditions. Green (1974) and Oehrle (1975) have each noted the fact that one condition on whether or not a particular verb shows dative alternation is the verb's origin: by and large, the double object structure is limited to non-Latinate verbs ("native" verbs in the terminology of Mazurkewich and White, 1984). Thus, alongside *give* one finds that *donate*, a Latinate verb of similar meaning, can only occur in the prepositional structure.

(3) a. John donated a book to the library.
b.*John donated the library a book.

Other pairs include *tell* vs. *explain, show* vs. *demonstrate*, and so forth. There are, of course, lexical exceptions to this generalization.

Of greater interest here is the fact that in addition to the Latinate/non-Latinate distinction, a thematic condition has been proposed. Goldsmith (1980) suggests that the double object construction is limited to instances in which the indirect object is animate and a "projected possessor" of the direct object.[4] Goldsmith proposes this analysis to account for paradigms such as (4) and (5).

(4) a. John sent the package to Mary.
    b. John sent Mary the package.
    c. John sent the package to Washington, D.C.
    d.*John sent Washington, D.C. the package.

(5) a. I owe five bucks to Joe Smith.
    b. I owe Joe Smith five bucks.
    c. I owe this example to Joe Smith.
    d.*I owe Joe Smith this example.

In (4b) *Mary* is the projected possessor of the package, whereas in (4d) *Washington, D.C.* is simply a "location," the final destination of the package but not a "projected possessor." Similarly, in (5b) *Joe Smith* is a projected possessor of *five bucks* but does not stand in that relationship to *this example* in (5d).

Goldsmith's analysis is intended to cover all double object constructions, not just those that appear to alternate with *to*-datives. Thus, the paradigm in (6) is subject to the same explanation as above.

(6) a. Jane made a doll for Ann.
    b. Jane made Ann a doll.
    c. Jane made an announcement for Ann.
    d.*Jane made Ann an announcement.

In (6b) *Ann* is the projected possessor of *a doll*, whereas in (6d) *Ann* is not a projected possessor (in any physical sense) of *an announcement*. Thus, Goldsmith's proposal accounts for dative alternations with both *to*-datives and *for*-datives.[5]

Owing to the hypothesized semantic/thematic restriction on dative alternation, English dative constructions offer a possible testing ground for investigating the potential relevance of thematic relations in SLA. Previous research (Mazurkewich, 1984a, 1984b;

Le Compagnon, 1984) has shown that, as expected with lexically-governed syntactic structures, L2 learners gain control of the English dative alternation only over time. On the basis of a study of French and Inuktitut L1 learners of English, Mazurkewich (1984b) proposes that the prepositional structure is less marked and presents evidence that L2 learners proceed from the less marked structure (the prepositional structure) to the more marked structure (the double object structure) in their acquisition of the English dative construction. Mazurkewich (1984a) and Le Compagnon (1984) focus on the influence of the syntactic structures allowed by the learners' L1 grammars (i.e., possible L1 transfer effects) with Mazurkewich rejecting the notion that transfer plays an important role and asserting that learners proceed from less marked to more marked constructions.[6] While some results of the present study bear on the issue of L1 transfer, other results indicate that some learners may use a thematic strategy for assigning syntactic structures independent of their particular L1.

SUBJECTS AND DESIGN

The study reported on here was a small scale pilot project designed to elicit acceptability judgments regarding dative alternation in English. Subjects were given a written copy of 35 test sentences and instructed to mark on a separate answer sheet whether they considered the English sentence "correct," "incorrect," or "don't know." Subjects were instructed that they were not being given a grammar test and should attempt to respond to the sentences according their own usage of English. The test sentences were randomized and interspersed with *for*-datives (not considered in the results) and a number of distractor items. The dative test sentences are given in (7); grammaticality judgments from a small native speaker control group are given here as well.

(7) Dative test sentences

*John asked a question to the teacher.
 John asked the teacher a question.

Mary donated $10 to the Red Cross.
*Mary donated the Red Cross $10.

John explained the problem to Mary.
*John explained Mary the problem.

Mark gave the book to Joan.
Mark gave Joan the book.

John recommended a good restaurant to Mary.
*John recommended Mary a good restaurant.

The girl sent a card to the boy.
The girl sent the boy a card.

John sold the car to Harry.
John sold Harry the car.

John told a story to the children.
John told the children a story.

Responses were obtained from 37 subjects, all of whom were students enrolled in the intermediate and advanced grammar classes of the Iowa Intensive English Program—a fairly standard university-preparatory English language program, including 20 hours per week of communications skills, reading, writing, and grammar instruction. Students are assigned to classes on the basis of an in-house placement instrument including short reading, grammar, and listening tasks, a writing sample, and an oral interview. References below to intermediate and advanced students indicate the levels to which they were assigned within the program. As no important claims are being made about ability level and use of a thematic strategy, no attempt is made to independently determine the proficiency of the subjects' English; however, TOEFL scores of the intermediate level are in the 430-490 range and TOEFL scores for the advanced level in the 480-530 range. The L1s of the subjects included: Chinese (n = 9), Farsi (1), French (1), Greek (1), Indonesian (4), Italian (1), Korean (2), Japanese (9), Spanish (7), and Thai (2). The questionnaire was administered during regularly scheduled class periods, and subjects were allotted as much time as they desired to complete the task; no subject required more than 20 minutes.

RESULTS AND PRELIMINARY INTERPRETATION

Most of the subjects appeared to have little difficulty with the task. All subjects were able to complete the task in 20 minutes or less and none reported any difficulty when asked during post-test debriefing. Additionally, the number of "don't know" responses was quite low and tended to be concentrated among a few subjects (2 or 3). The inclusion of the equivocal responses had no significant impact on the results. A number of subjects had some difficulty with the pair of sentences containing the verb *recommend*. In fact, a majority of subjects either selected the "don't know" category or considered both sentences "incorrect." This indicates that results obtained from these items are among the most unreliable (perhaps due to subjects not knowing the word). Therefore, in the ensuing discussion, results with the verb *recommend* are disregarded for all subjects.

Table 1: Response groups identified in study

Group	Brief Characterization	n	L1s
1	Native or near-native English judgments	5	Chinese, Farsi
2	Mixed acceptability judgments	5	Chinese, Japanese, Thai
3	Double object construction judged unacceptable	7	French, Greek, Japanese, Spanish
4	Prepositions and double object constructions acceptable for all verbs	10	Chinese, Indonesian, Japanese, Korean
5	Double object construction acceptable for governed subset of verbs	10	Indonesian, Italian, Japanese, Korean, Spanish

On the basis of their responses, subjects fall roughly into one of five groups. A brief characterization of the different groups is given in Table 1. More complete discussion of the group characteristics are given in the discussion that follows.

The complete results for the dative test verbs are given in the text for each group in turn. I now describe each group and offer preliminary interpretation of the results.

Group 1: Native or Near-Native English Judgments

This relatively small group (n = 5) included subjects whose L1s were Chinese (4) and Farsi (1); two subjects were in the advanced level and three in the intermediate level. Subjects in this group had a fairly firm grasp of the fact that certain dative verbs cannot occur in the double object construction. Subjects were included in this group if they accepted at most one ungrammatical English dative construction. For example, as indicated in Table 2,[7] Subject 2 accepted as grammatical almost all double object ([NP NP]) sentences; this subject rejected the double object construction with *explain*, as would native speakers, but did accept the ungrammatical double object sentence

Table 2: Group 1 Results for Dative Test Verbs

Subject	[NP PP]	*[NP PP]	[NP NP]	*[NP NP]
1	(all)	*ask, donate	(all)	donate, *explain
2	(all)	*ask	(all)	*explain
3	(all)	*ask	(all)	donate, *explain
4	(all)	*ask	(all)	donate, *explain
5	(all)	*ask, donate	(all)	donate, *explain, send

NOTE: Key for all data tables
[NP PP] = prepositional structure considered acceptable
*[NP PP] = prepositional structure considered unacceptable
[NP NP] = double object structure considered acceptable
*[NP NP] = double object structure considered unacceptable
ALL = all test verbs fall into this category
(all) = almost all test verbs fall into this category—exceptions are noted
?verb = subject response was "don't know" for marked verbs in this category
*verb = native judgment for this construction with this verb

with *donate, *Mary donated the Red Cross $10.* Also, as shown in Table 2, all Group 1 subjects rejected the sentence *John asked a question to the teacher*, a sentence accepted by a sizable majority of the subjects.

Group 2: Mixed Acceptability Judgments

This group, comprised of five subjects whose L1s were Chinese, Japanese, and Thai (3 advanced, 2 intermediate), is essentially a non-group. Responses from subjects in this group displayed no discernible pattern. It is possible that some subjects in this group understand that some English verbs take the double object construction while others do not, but such a conclusion would be highly speculative. The data in Table 3 illustrate the lack of a cohesive pattern of responses here.

Table 3: Group 2 Results for Dative Test Verbs

Subject	[NP PP]	*[NP PP]	[NP NP]	*[NP NP]
6	(all)	send (?explain)	ask, *explain, give, send	*donate, sell, tell
7	*ask, donate, send	explain, give, sell, tell	give, tell	ask, *donate, *explain, sell, send
8	(all)	explain	ask, give, send	*donate, sell, *explain, tell
9	donate, explain, give	*ask, send, sell, tell	(all)	*donate
10		ALL	ALL	

As indicated in Table 3, one subject (Subject 6) considered the prepositional structure grammatical for all test verbs but partitioned the double object construction in the following way: grammatical for the set {ask, explain, give, send}, ungrammatical for the set {donate, sell, tell}. Another subject (Subject 8) allowed the double

object construction for the set {ask, give, send} but ruled it out for {donate, explain, sell, tell}. Again, this subject accepted the prepositional structure for almost all verbs.

Subject 10 is a bit of an anomaly. This subject rejected the prepositional structure for dative verbs in English, considering only the double object construction acceptable. Thus, unlike the other subjects in this group, Subject 10 is treating all of the test verbs in the same way, but in a way unlike any other subject in the pilot study. One could argue that these results constitute a slight variation on the pattern exhibited by either Group 3 (no double object construction) or Group 4 (productive dative alternation). However, given the present state of the findings, I elect to include these results in the elsewhere group.

Group 3: Double Object Construction Considered Unacceptable

This group (n = 7) included subjects whose L1s were French (1), Greek (1), Japanese (1), and Spanish (4); four were in the advanced level and three in the intermediate level. As shown in Table 4, these subjects considered all (or almost all) double object constructions to be unacceptable.

Table 4: Group 3 Results for Dative Test Verbs

Subject	[NP PP]	*[NP PP]	[NP NP]	*[NP NP]
11	ALL			ALL
12	(all)	explain	give	(all)
13	(all)	give	give	(all)
14	ALL		donate	(all)
15	ALL			(all) ?ask
16	(all)	explain		ALL
17	ALL			ALL

It is notable that with only a handful of lexical exceptions (none of which are included in the test verbs) double object constructions with full lexical NPs are ungrammatical in these languages. One might reasonably hypothesize that subjects falling into this group have superimposed their L1 grammar on the English sentences in rendering acceptability judgments.

This interpretation receives some support from Le Compagnon's (1984) study of the acquisition of English dative constructions by speakers of French. Le Compagnon reported L1 effects in both spontaneous speech and in grammaticality judgments tasks on the part of her subjects. In particular, the grammaticality judgments with full NP indirect objects (as opposed to pronominal indirect objects) show the same pattern as the Group 3 responses.

Group 4: All Verbs Show the Dative Alternation

This represents a comparatively sizable group of subjects (10) with a variety of L1s—Chinese, Indonesian, Japanese, and Korean—and a distribution of ability levels—7 advanced and 3 intermediate students. For this group almost every dative verb was acceptable in both the prepositional and double object structures.

Table 5: Group 4 Results for Dative Test Sentences

Subject	[NP PP]	*[NP PP]	[NP NP]	*[NP NP]
18	ALL		(all)	tell
19	ALL		(all)	?donate
20	(all)	give	(all)	*donate
21	ALL		(all)	send
22	ALL		(all)	?sell, send
23	ALL		(all)	ask
24	ALL		(all)	sell
25	(all)	explain	(all)	*donate
26	ALL		(all)	*donate
27	ALL		(all)	sell

One might hypothesize that learners in this group have recognized the fact that (in the main) dative verbs in English may be expressed with a prepositional structure or a double object structure. Although subjects in this group may consider one particular verb a lexical exception to the double object construction, these subjects accepted all dative sentences with the prepositional structure, including verbs such as *ask,* which is a lexical exception in English.

For example, one Japanese subject (Subject 18) considered all verbs candidates for either the prepositional structure or the double object structure with the exception of *tell*, which was

considered unacceptable in the double object construction. One speaker of Chinese (Subject 23) considered the double object construction an option for all verbs except *ask.* For whatever reason (see further discussion below), the subjects falling into this group have a fairly generalized rule—all (with perhaps one lexical exception) dative verbs tested can occur in either syntactic construction.

The Group 4 results are particularly interesting from the standpoint of previous work on L2 acquisition of dative alternation. Based on data from an acceptability judgment task administered to native Inuktitut-speaking and native French-speaking learners of English, Mazurkewich (1984b, p. 92) claims that overgeneralizations of the dative alternation are not found "in abundance." She uses this as an argument for taking dative alternation to be a lexical subcategorization property rather than a syntactic rule. The Group 4 results cast some doubt on this assertion about the relative scarcity of overgeneralization of the double object structure. (See also Subject 10, discussed above under Group 2.)

Group 5: A Semantically-Governed Subset of the Verbs Allows the Double Object Construction

Ten of the subjects (6 advanced, 4 intermediate) fall into this group. These subjects represent the widest variety of L1s— Indonesian, Italian, Japanese, Korean, and Spanish. Subjects in this group apparently recognize that the dative alternation is not completely productive in English. However, they arrived at an innovative rule for determining which verbs can alternate.

The results in Table 6 seem to indicate that while the results are not exactly perfect, the core of the data suggests that subjects in this group essentially treat the verbs *ask, explain,* and *tell* one way and verbs such as *donate, give, sell,* and *send* in another. Eight of the subjects allowed both sets of verbs to occur in the prepositional structure but allowed only verbs in the *ask* set to occur in the double object structure. The two remaining subjects treated the verbs slightly differently. Subject 36 allowed only the *give* set to occur in the double object construction, considering the double object construction with verbs from the *ask* set (plus *send*) unacceptable. Subject 37 accepted double object structures for both sets of verbs but restricted the prepositional structure to *ask, explain,* and *tell.*

Table 6: Group 5 Results for Dative Test Sentences

Subject	[NP PP]	*[NP PP]	[NP NP]	*[NP NP]
28	ALL		ask, *explain, tell	*donate,give, sell, send
29	(all)	tell	*explain, tell	(all)
30	(all)	donate	ask, *explain, tell (?donate)	give, sell, send
31	(all)	donate	ask, *explain, tell	*donate, give, sell, send
32	ALL		ask, *explain, give, tell	*donate, sell, send
33	ALL		ask, tell	(all)
34	ALL		ask, tell	(all)
35	ALL		ask, give, tell	*donate, *explain, sell, send
36	(all)	give	*donate, give, sell	ask, *explain, send, tell
37	*ask, explain, tell	donate, give, sell, send	ALL	

As stated above, the treatment of the two sets of verbs was not absolute. Two subjects in this category treated the set {ask, explain, give, tell} as a group and one other subject added *send* to {ask, explain, tell}. Additionally, some subjects only allowed a subset of the *ask* set in the double object construction. Two subjects allowed only {ask, tell} to alternate while another subject accepted alternation with the subset {explain, tell}.

This individual variation notwithstanding, the central fact is rather striking—the subjects that fall into this group recognize a difference between the two core sets of verbs and appear to make syntactic acceptability judgments accordingly. The two sets of verbs can be distinguished semantically: as used in the test sentences, the set {ask, explain, tell} involves transfer of information, while the set {donate, give, sell, send} involves transfer of some physically possessable object. I return to this matter in the following discussion.

The Case for a Thematic Strategy

I would like to suggest that the Group 5 results reflect the fact that L2 learners may have at their disposal a thematic strategy for assigning syntactic structures to particular verbs. As noted above, one can reasonably divide the sets of verbs {ask, explain, tell} and {donate, give, sell, send} along semantic lines. The linguistic construct of thematic roles (e.g. AGENT, THEME, GOAL, LOCATION) provides a framework for drawing this distinction.

Broadly speaking, dative verbs take three arguments which can be thematically designated AGENT, THEME, and GOAL.[8] Thus, one could assign any of these verbs predicate-argument structures such as:

(8) a. ask (AG, TH, GO)
     b. give (AG, TH, GO)

Predicate-argument structures such as (8a and b) present only a skeletal view, highlighting similarities of these verbs but obscuring differences.

The differences between the exemplified predicates can be captured through a more detailed thematic analysis, overlaying the "core" thematic roles with additional thematic specification. For example, the {ask, explain, tell} set can be distinguished from the {donate, give, sell, send} set in terms of the property of the GOAL arguments. Modifying Goldsmith's (1980) notion slightly, we might claim that the GOAL of verbs of the *give* set can be viewed as a "projected possessor" of the direct object NP. We might suggest then that the dative arguments of these verbs have the complex thematic designation [GOAL, POSS]. Conversely, verbs of the *ask*

set have a simple GOAL designation of the dative argument. This is a slight modification of Goldsmith's proposal inasmuch as he suggests that in order to account for the fact that a verb like *tell* can occur in the double object construction one must extend the notion of possessor to include possession (or receipt) of "knowledge." In analyzing the results reported here, it appears necessary to draw a stricter distinction and relegate the notion of "projected possessor" (interpreted as an additional POSS role here) to cases of physical possession.[9]

This thematic distinction can be used to account for the Group 5 responses. As we have seen, the *give*-type verbs have a more restricted syntactic distribution than do the *ask*-type verbs. That is, when the GOAL is something that can physically receive the THEME (i.e., [GOAL, POSS]) for Group 5, it must always be realized in a prepositional phrase (*to* NP) for eight of the subjects (and can only be realized as a bare NP for another subject). Conversely, when the GOAL is not a possible physical possessor of the THEME, it may be realized either as a PP or a bare NP. Clearly, one can hypothesize that these subjects are assigning syntactic structures on the basis of the thematic relations of the arguments of the predicate.

This syntactic assignment could take the following form. Those subjects who accept either structure for the *ask* set would assign lexical subcategorizations such as:

(9) *ask* {[___ NP PP], [___NP NP]} (GOAL)

and for the *give* set

(10) *give* [___NP PP] ([GOAL, POSS])

These lexical subcategorizations would be determined by the thematic specification of the GOAL argument in the predicate-argument structure, indicated in parentheses following subcategorization frames for convenience here.

Interestingly, one might further hypothesize that subjects in Group 4 operate in nearly the same fashion. Note that we can account for Group 1 results in terms of near-native control of dative verbs, Group 2 results in terms of almost no control of dative verbs, Group 3 results in terms of L1 interference, and now Group 5 results in terms of a thematic strategy. What remains is to account

for Group 4 results. I would like to suggest that the Group 4 results are consistent with a thematic account paralleling the Group 5 results. If correct, a thematic explanation may account for the majority of experimental results for the dative alternation. As noted above, all dative verbs have the same basic predicate-argument structure, reflected in (8). Recall, however, that subjects in Group 4 treat virtually all dative verbs the same, that is, all dative verbs can take either the prepositional or double object structure. We might claim that Group 4 subjects ignore the possible distinction between types of GOAL arguments, i.e. ([GOAL, POSS] vs. plain [GOAL]) and assign syntactic structures on the basis of the broader predicate-argument structure. Thus, all verbs with the argument set {AG, TH, GO} are assigned subcategorization frames as in (11):

(11) Verb (AG, TH, GO): {[___NP PP], [___NP NP]}

Although the Group 4 responses need not necessarily be analyzed in this way,[10] this analysis is plausible and is consistent with positing a thematic strategy for L2 learners.

One might claim that the Group 5 results are not particularly surprising; after all, some theoreticians have suggested that dative alternation is at least partially controlled by such thematic considerations. What is more difficult to explain, however, is the fact that nine of the subjects who appear to be operating with a thematic strategy apply it in a way that is inconsistent with the facts of English. If anything, these speakers are arriving at exactly the wrong rule. This fact suggests that the group 5 subjects are not making acceptability judgments based on memorized knowledge of particular English verbs but are actively using a thematic/semantic strategy. Importantly these speakers are all making the same thematic distinction. It may be that these subjects have arrived at this rule from a combination of the influence of English and of some independent universal of thematic structure. Such a position would account for the fact that the subjects basically applied the rule in the same way, rather than some of them judging that only the give set of verbs could occur in the double object construction and others judging that only the *ask* set of verbs could occur in the double object construction.[11]

CONCLUSION

In the present study I have attempted to show that a reasonable interpretation of the responses of at least one group of subjects (comprising more than 25% of the experimental group) provides evidence that L2 learners may apply a thematic strategy in assigning syntactic structures to English dative verbs. Given the fact that the data on which this conclusion is based come from a grammaticality judgment task, one might harbor reservations about the strength of this claim. Therefore, before continuing, I would like to examine the nature of the results reported here.

Grammaticality judgment tasks are being used with increasing frequency in SLA research. This is due in part to the direct application of Chomskyan grammatical theory (i.e., the principles and parameters model) in many studies and a concomitant assumption. This assumption, commonly accepted within much of formal linguistics, is that grammaticality judgments reflect a speaker's linguistic competence, whereas performance data can suffer from the interference of many largely nonlinguistic factors. Granting the viability of this assumption, data gathered from grammaticality judgment tasks, such as the one on which this study is based, have an important role to play in SLA research.

At the same time, the results should be interpreted with caution. A grammaticality judgment task may itself skew results. Such a task may lead a subject to adopt a translation strategy, that is, translating L2 to L1, in order to evaluate test sentences. This might then lead a subject to rely more heavily on his or her L1 in judging the acceptability of a sentence. Alternatively, a subject may unwittingly formulate a hypothesis regarding a particular set of data in response to a metalinguistic task. The particular formal solution a subject arrives at may not faithfully reflect his or her internal grammar of L2. One can clearly imagine other potential problems.[12] Thus one must also seek corroborating evidence from other sources.

However, many of these possible reservations seem to be answered by the data. Inasmuch as only seven of 37 subjects appear to have relied heavily on their L1 in determining acceptability of the English sentences, it would not appear that the task overwhelmingly biased results in that direction. This is especially true since reliance on L1 in learning an L2 is well documented. Also, the fact that so many subjects adopted the same thematic strategy casts doubt on the

subjects being unwittingly led to this as an idiosyncratic artificial solution. Again, more research will decide these issues.

One more word of caution is undoubtedly in order. As I have attempted to make clear throughout the discussion, the experimental results reported on are from a pilot study. The number of subjects studied is relatively small; for this reason no statistical analysis of the results was conducted. The low numbers certainly leave open the possibility that the "interesting" results obtained from the pilot study are due to chance. Clearly the next step is to pursue a larger scale study that perhaps includes more controls, more measures, and increased opportunities for random sampling. At the same time, as much work in theoretical linguistics is based on individual intuitions and judgments, the potential interest of individuals and what they may show in this case should not necessarily be overwhelmed by requirements of statistical significance.

Possible reservations acknowledged, the results reported here do point to a potentially important area for SLA research. Admitting a thematic account of the Group 4 and Group 5 results, it appears that some L2 learners may rely heavily on thematic strategies in acquiring a second language or some structures in a second language.   If so, this represents yet another potential similarity between first and second language acquisition. Grimshaw (1981), Macnamara (1982), and Pinker (1984) have all proposed that in learning a first language, children rely heavily on a semantic strategy in constructing the syntactic categories hypothesized to be necessary for acquisition to take place—what Pinker has called "semantic bootstrapping." Among the constructs hypothesized to be relevant are thematic roles. As part of this hypothesis, Pinker argues that L1 acquirers associate thematic roles such as AGENT, THEME, and so forth with particular grammatical functions (e.g., subject, object), which are part of annotated phrase structures. Thus, thematic roles (and other semantic notions) contribute directly to the development of syntactic categories, functions, and morphology (such as case and agreement). Despite the fact that adults have presumably acquired the syntactic categories necessary to analyze language, in approaching a second language it seems plausible that some may adopt a semantic bootstrapping strategy (perhaps in a slightly altered form) as part of their battery of language learning strategies, especially in cases of trying to sort out

the structural idiosyncrasies of lexical items. Of course, much work remains to be done to determine the validity of such a hypothesis and, admitting its validity, the scope of such a strategy.

As the semantic bootstrapping hypothesis is relevant to L1 acquisition and is partially grounded in the fact that children do not have fully developed grammatical constructs at their disposal, one might hypothesize that a thematic strategy has more relevance in the early stages of L2 acquisition, when the L2 learner has not completely determined which of the universal set of grammatical constructs are most important. However, results from this study do not seem to support such a view. I have made no claims with respect to acquisitional sequence here. Interestingly, the numbers of "intermediate" and "advanced" students falling into each group was fairly equal. Granted, no independent measurement of proficiency was undertaken, so these groups may not be as heterogeneous as they currently appear. One might indeed find some correlation between the specific groups and some overall language proficiency measure. However, it may also be that the acquisition of lexical structures of this kind is not necessarily tightly bound to overall language proficiency inasmuch as dative alternation is a property of particular lexical items; one would thus expect the acquisition of vocabulary to proceed somewhat idiosyncratically. The fact that groups 4 and 5, those subject to a thematic account, include fairly equal numbers of intermediate and advanced learners indicates that the thematic strategy posited here may be available as a strategy throughout the course of SLA and not merely in initial stages.

Results of the present study suggest a potentially fruitful area of SLA research. A task as complex as learning a second language is arguably approached by different people in a variety of ways. The preliminary results reported here suggest that a thematic strategy may be one of a battery of learning strategies available to L2 learners. It may be viewed as a component of Polomska's (1988) acquisition strategies or added to McLaughlin's (1978) acquisition heuristics or incorporated into some other framework. Results of future research should determine the appropriate contribution of thematic roles in the acquisition of a second language.

ACKNOWLEDGMENTS

NOTES

[1]   GB is neither the first theory to recognize thematic roles nor the only theory to accord them a central position. Frameworks including Fillmore's (1968) Case Grammar, Dik's (1978) Functional Grammar, Bresnan's (1982) Lexical-Functional Grammar, and others make use of thematic relations and often refer to them extensively in core analyses. A range of interpretations is given to the status of thematic roles; Chomsky (1981) treats them as syntactic entities, while Jackendoff (1987) views them as grounded in conceptual structure. However, their precise nature will not be taken up here. Throughout the present work I adopt a basic EST/GB framework for exposition in order to facilitate comparison with previous studies. In so doing, I have made a conscious decision not to incorporate a number of changes in the general GB principles and parameters framework. This decision rests on my conviction that the main theoretical point to be made here regarding a possible thematic strategy in SLA is independent of the particular theory of grammar to which one subscribes. The facts considered here could be discussed just as easily in other syntactic frameworks with no impact on the conclusions drawn.

[2]   There are viable alternatives to such a thematic role assignment mechanism, but the precise nature of association of thematic roles and syntactic arguments falls outside the scope of this study.

[3]   This assertion may be somewhat controversial. Although many assume that there is a universal inventory of thematic roles, well-articulated theories of thematic roles are elusive. For example, Ladusaw and Dowty (1988) argue that thematic roles are not grammatically significant entities at all. See also Dowty (1991). For present purposes, however, I will proceed under the more generally accepted assumption that an appropriately rich and precise theory of thematic roles can be achieved.

[4]   Stowell (1981) makes a very similar proposal, claiming that the indirect object of the double object construction bears the role POSSESSOR.

[5]   The present study does not treat both *to*-datives and *for*-datives because the results of the study indicated that particular L2 learners were not necessarily treating the two constructions in the same way. This finding is interesting in light of Mazurkewich's (1984a) report in her study of dative questions that French and Inuit learners of English were more advanced in their control of *to*-datives than *for*-datives. Hawkins (1987) reports a very similar finding and argues that the two subclasses of

datives should be considered separately when describing the developmental sequence of the dative construction in L2 learners of English. Thus, I leave consideration of the *for*-datives and their interaction with dative alternation to future work.

6   Bardovi-Harlig (1987) and Newcomb (1992), in attempts to replicate Mazurkewich (1984a), in fact, found that in dative question and relativization constructions English L2 learners actually proceeded from marked to unmarked in the acquisitional sequence, contrary to Mazukewich's interpretation of her findings.

7   Subject numbers were reassigned following analysis solely for ease of discussion.

8   GOAL is the most frequently used term for the thematic role of the dative argument. Some systems use RECIPIENT rather than GOAL. Also, the AGENT of some dative verbs may have additional role specifications, notably SOURCE, as in Jackendoff's (1972) analysis of *sell* and others.   Such additional thematic specifications might seem *prima facie* evidence against a narrow interpretation of the θ-Criterion. However, in the absence of an explicit theory of thematic roles, this is difficult to evaluate and peripheral to the issue at hand.

9   The fact that there may be a number of ways to assign the POSS role to GOAL arguments (as hinted at in this discussion) may in some way account for the slightly variable class membership of the verbs in question.   A larger corpus of data is needed before investigating such a possibility though.

10   One might propose a purely syntactic account for Group 4 respondents, hypothesizing that these learners have a rule along the lines of Dative Shift in the Standard Theory that is free to transform any **NP to NP** sequence to the double object structure.   Oehrle (1975), Baker (1979), and others have argued against such an analysis of the English dative alternation, citing lexical restrictions, learnability problems, and other arguments. However, given differences between first and second language acquisition, such considerations might be set aside as the Dative Shift analysis would be consistent with the Group 4 data.

11   Of course, one cannot discount the fact that the sample size for the reported experiment is relatively small, and thus attribute the asymmetry to sampling error.   Further consideration of the strength of the implications of this study appear in the conclusion.

12   There is a growing literature questioning the validity and reliability of grammaticality judgment tasks in SLA research (e.g., Ellis, 1990, 1991; Goss, Ying-Hua & Lantolf, 1991; Lantolf, 1990).   However, for a contrasting view of the value of grammaticality judgments in SLA research see Munnich, Flynn, and Martohardjono (1991).

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William D. Davies is Associate Professor of Linguistics at the University of
Iowa. His research interests include syntactic theory and description, and the
application of current linguistic theory to second language acquisition with
attendant issues in data collection within that domain.

Problematic ESL Content Word Choice in Writing: A Proposed Foundation of Descriptive Categories

David Leech
University of California, Los Angeles

Accurate and native-like word choice in writing is an important but problematic area of second language use. This paper presents an analytic foundation for pedagogical research and application which extends beyond the traditional 'superficial' categories of morphosyntactic rule violations and false cognates. Simultaneous 'complementary' analytic categories are proposed: the complexity of understanding word choice in written production entails the incorporation of several relevant theoretical and applied perspectives: lexical-semantics, syntax, text-analysis, pragmatics, language acquisition, cognition and memory, and pedagogical research. This study focuses on the first four as a necessary preliminary step. Major categories of word choice analysis are synthesized from both a theoretical perspective and from an empirical one, with an examination of data from ESL writers. The paper goes on to discuss implications for ESL pedagogy and further research.

ESL WORD CHOICE IN WRITING

The second-language learner's word choice errors in academic writing can seriously impact the student's overall academic success, often resulting in misinterpretation or incomprehensibility. The reader's native or near native sense of "wrongness," even where comprehensibility is not affected, may entail an unfairly negative evaluation of the overall quality of the written work, in terms of its scholarship, clarity, or both. Moreover, when such a reader is an academic instructor with the power to judge and hence determine academic achievement, the consequences for the second-language learner can be a misunderstanding of the student's scholarly achievement or communicative ability.

The precise nature of a particular word choice problem may not be clear to an ESL instructor, since the choice itself may involve subtle factors, sometimes of several types simultaneously. It is perhaps for this reason that there is a lack of pedagogical material to specifically deal with this general phenomenon, which probably occurs at all ESL achievement levels. TESL vocabulary materials have traditionally been based on native-speaker pedagogy, which is generally oriented toward the passive learning of vocabulary (memorization), active but purely receptive reading skills (inferring meaning from context and Greco-Latin morphology), and error correction (teacher-dependent revision). The missing consideration among all these approaches has been a lack of focus on the linguistic and real-world knowledge compendium known as the lexicon—particularly as it is used in the conceptually-driven recall and associative retrieval of lexical items in acts of written text *production*. In this paper, I will survey what I believe to be the necessary levels of analysis, and from this, attempt to derive a typology which might be applied to identifying the linguistic and other problems with unsuccessful word choices in ESL writing, focusing on the basic word classes of nouns, verbs, and adjectives.

A PRACTICAL QUESTION ABOUT WORD CHOICE IN WRITING

What constitutes successful (acceptable to native speakers) versus problematic ESL content word choice in writing, and how are successful word choices made? This is an applied linguistics question in the purest sense because it derives from the need to handle a practical problem, as any ESL writing instructor can attest. Although there is an urgent need for direct research answers to this question, there is certainly a paucity of useful research solutions. Perhaps it is also a naive question from the point of view of the psycholinguistic or the language performance theoretician: the problematicity of ESL word choice is often a consequence of interacting variables which are likely to be discovered only by operating from several theoretical viewpoints simultaneously. Although reasonable from a pedagogical viewpoint, therefore, this

vital question has remained largely unanswered.[1] It is up to ESL researchers and instructors, then, to make use of several theoretical viewpoints, and to begin to lay some practical foundation for dealing precisely and effectively with the unending instances of problematic word choices in the writing of ESL students. Establishing this foundation requires us to confront the complexity of relevant analytic categories and to produce an encompassing set of useful conflations of them.

The requirement for a comprehensive set of such categories arises from a practical teaching need. While most second language writers regularly make successful word choices, they also make unacceptable ones, some on a fairly regular basis, others only sporadically. Unfortunately, the problem involving the non-fluent, continual word choice errors of ESL writers has been largely ignored by researchers (Laufer, 1986). Further, the relevant existing research looks at only bits of the question, usually in terms of reception rather than production, and does not furnish an overall, pedagogically applicable view of the problem. My purpose in the present paper is to propose a basis for and to provoke an interest in the study of ESL word choice in writing by presenting the descriptive categories which I have found to be the most useful in assessing problematic content word choices.[2]

SURVEY OF DESCRIPTIVE CATEGORIES

I will begin this survey with a brief discussion of categories of content word choice problems and their L1 and interlanguage sources which have traditionally been the focus of research (e.g., Nation, 1990; Channell, 1988; Carter, 1987; Meara, 1987; Palmberg, 1987). Identifying these categories is not particularly difficult since any one category tends to fully define the problematicity of the word choice to which it applies. These categories will be termed *superficial categories* and are summarized in Figure 1, below. The survey will then look into areas of categorizations which may be less obvious, those which are usually describable only by taking into account the potentially simultaneous interaction of more than one textual level and more than one

descriptive category. These will be termed *complementary categories*. A general framework for pedagogical application is then proposed.

Superficial Descriptive Categories

Identifying the relevant descriptive categories of some unacceptable word choices is a relatively straightforward task, as they are largely dependent on either a single co-textual variable (morphosyntactic or referential) or on a single contextual (pragmatic) consideration, such as register. See Figure 1.

Figure 1. Superficial Descriptive Categories

CATEGORY	EXAMPLE
•morphosyntactic or lexical-derivational	*"thinkings" [pluralized non-count gerundive] (Examples (1) - (4) below)
•pragmatic register	*"so" [= *very*] (Example (5) below)
text-deictic	*"first" [= *before* or *next*?] (Example (6) below)
"	*"the inside [of NP]" [indeterminable antecedent NP] (Example (6) below)

Word forms may be unacceptable because of morpho-syntactic or lexical-derivational violations. For example, a student may write

(1) **informations* (vs. *information*)

or

(2) **thinkings* (vs. thoughts)

The student may not know that some non-count nouns may not be made countable; or that some can be, resulting in a new lexeme, as below:

(3)   a) *food* --> *food(s)*
        b) *light* (illumination)-->*light(s)*

or effecting no denotational change in meaning, as in (4):

(4) *data is* --> *data are*

Other word choices may be unacceptable for certain well-known pragmatic reasons. For example, a student who writes in her academic research report

(5) **These results are so significant*

vs.

(5') *These results are **very** significant,*

violates register or discourse community constraints. The same could be said for pronoun+AUX contractions, where informal or conversational structures violate formal register constraints. Other examples of pragmatic problems with word choice are provided by the following example excerpted from the corpus of student data:

(6) *Before pouring the measured amount from a beaker, an agar medium was prepared.* **It** *was put* **the** **inside first.**

The intended meaning conforms with the paraphrase in (6'):

(6') *An agar medium was prepared inside a beaker; a measured amount of the medium was then poured out.*

In the second original sentence of (6), not only is the referent for anaphoric 'it' ambiguous, the referentially 'old' information—"the inside [of *something*]"—implied by the anaphoric deletion is not certain. These are text-deictic problems of grammatical anaphor (as opposed to lexical-semantic 'cohesion', see the discussion of lexical-semantic problems below). Also, "first" may be redundant with "before" in its intended meaning—the time of the preparation of

the agar medium, or "first" may indicate a time prior to or simultaneous with that denoted by "before." Word choice problems, then, can be linked to faulty conversational implicatures in temporal and spatial deixis.

There are some clear-cut sources for the problems discussed so far. An easily understood source of problematic word choice results from language-to-language 'translation.' One might see the L2 (second or non-native language) writer's use of 'false friend' cognates from diachronically related languages, as in (7):

(7) *(estar) constipado* [Span.] ≠ (have a) cold[3]

Alternatively, the source language may *not* have a diachronic relationship with the language being written, with the similarity of form being purely a matter of chance. Worse yet are those errors in choice of function words traceable to faulty target language instruction or translation dictionaries, as in (8):

(8) *zhídào* (Chin.) [= 'not until']--> *until*.[4]

Researchers might also observe typological transference from a relatively morphologically 'free' language to a relatively 'bound' one. For example, a problem involving count/noncount nouns as in (3) above may have its source in the lack of a similar inflectional system in the L1 for marking plural or mass nominals. Finally L1 lexical-semantic systems, directly translated or imposed, may violate the internal argument structures of the L2 lexical items themselves (e.g., Chinese --> English; see discussion of problematic word choice example (12) below). The detection of this type of error is difficult without a comparative analysis of the two languages, but such analyses are sometimes available for teachers and students (e.g., Swan & Smith, 1987). In principle, translation effects on written word choice are a straightforward matter to explain (cf. Laufer, 1988).[5]

Complementary Descriptive Categories

The foregoing discussion involved superficial categories which generally provide single conclusive descriptions of some types of problematic word choices; in other words, each superficial

descriptive category labels a 'type' of problematic word choice. In contrast, the following discussion involves categories which generally apply in some complementary combination, rather than singly, to particular word choices.

Lexical-Syntactic Problems

Particular verbs may take a selectionally restricted or limited set of prepositions in the bulk of dialects of a language, or according to the target dialect at issue (in this case, 'Standard American English'); (e.g., *interested in/*on*). The modification of words from other categories may also be so restricted, as is well known (adjectives, for example: *angry {with it, about it, *on it, for a reason, *for it}*). Semantic role assignments and their consequent impact on the meaning of the realized sentence may be improperly or incompletely understood by the L2 writer, as below:

> (9) **A complicated system may destroy because of a minor event.*

That is, 'a complicated system may be destroyed/may break down because of a minor event'; or, 'a minor event may destroy a complicated system'. While categorized as a lexical-syntactic problem, either a syntactic solution (passivization) or a lexical-semantic solution (use of an ergative or middle verb such as *break down*) could repair the sentence. Subcategorization problems may also seem to the native reader to be word choice problems committed by the non-native writer. In such cases, of course, verbs may be substituted for nouns, finite clauses for nonfinite clauses, and so on. Problems such as these may be viewed as word choice problems which involve lexical-syntactic rather than lexical-semantic competence.[6] Some of the areas just mentioned might be better termed semantic, but I wish to adopt a broad view of what syntax is relative to vocabulary and reserve 'lexical-semantics' as a term for the text-independent or conventional denotational paradigms of semantic fields and for text-sensitive sense interpretations, for example, 'connotations.'

Lexical-Semantic Problems

The lexical-semantics of a word may also be incompletely or inaccurately controlled, resulting in denotational, connotational, or ambiguity problems.   For example, consider *He was hostile/aggressive* (denotational hyponyms), *She rushed/hurried* (connotationally more-or-less action-focused), and *The police traced the body* (homonymic ambiguity: "traced" with chalk or via dental records?).   Of course, the text in which a word is embedded is essential to the production of word choices. Related to this is the problem of lexical-semantic cohesion across a text, for example, in using a general (intensional, abstract, or superordinate class) word when a particular (extensional, concrete, or hyponymic) one is called for, and *vice versa*; for example, *a very big problem* versus *a major flood* (see Halliday & Hasan, 1976, 1989 and Hoey, 1991). As for L1:L2 effects on word choice, these have been previously discussed. As pointed out then, this is an important but resistant area of understanding, due in part to the frustrating lack of research on natural L2 lexical production.

Collocational Problems

The collocational demands of particular words (conventional co-occurrences) may also be a special type of lexical-semantic issue, in the sense that collocations operate as multi-word units. However, the notion of collocations has been expanding in recent years to include everything from selectional restrictions to prefabricated expressions to semantically cohesive lexical chains throughout a text. I use the term 'collocation' more narrowly (and traditionally) here; that is, as referring to commonly associated content words, such as *computer + system*, *volcano + eruption*, etc. (c.f., Hakuta, 1974; Verschueren, 1981; Pawley & Syder, 1983; Halliday & Hasan, 1989; Sinclair, 1991; Hoey, 1991; Nattinger & DeCarrico 1992; and Leech, 1993b for relevant discussions.) Creating purely original combinations of words may violate native expectations; not following collocational expectations may stigmatize a non-native speaker.
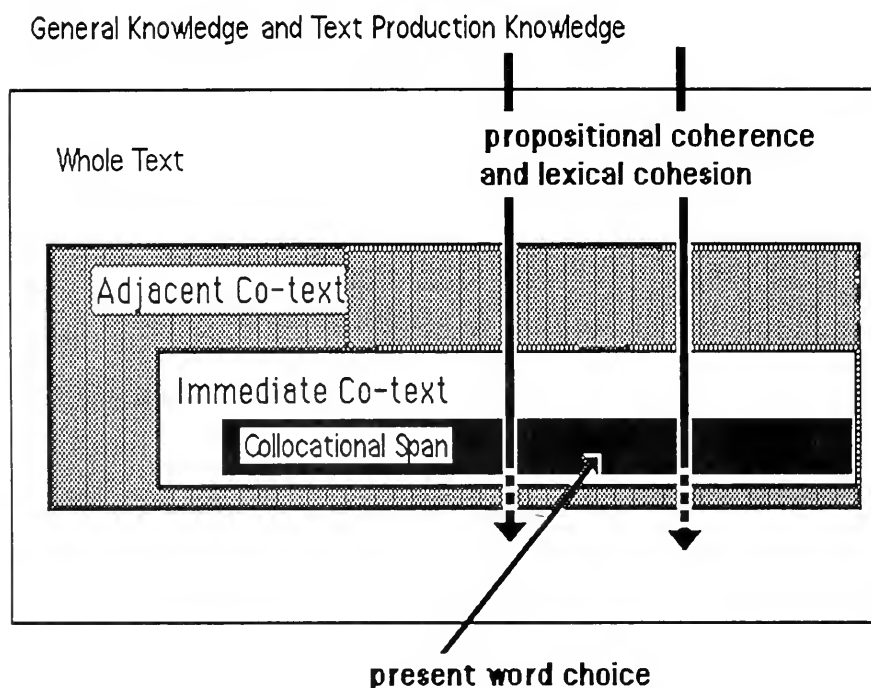
Logicality, Topic Knowledge, and Overlap

Of course, certain discourse and topic knowledge is also necessary for successful word choices (cf. Daneman & Green, 1986). Obviously, information must be accurately denoted, presuppositions and implications adequately handled, and cultural expectations met, a requirement which extends to register. Not only this, but the phenomenon of overlap, or simultaneously existing effects of problematic word choices at different levels of analysis should be expected, since there is no basis to presume that, for example, a lexical-semantic problem may not also be accompanied by a syntactic problem or a larger problem of logical coherence or discourse register; these are not mutually exclusive categories.

TEXTUAL AND CONTEXTUAL LEVELS OF ANALYSIS

The foregoing discussion of analytical means by which to explain problematic word choice effects (on the reader) must ultimately be considered within an account of the co-textual and contextual levels with which the embedded word choice interacts. This can be illustrated as in Figure 2 (below).

Figure 2. Framework of Levels of Word Choice Factors

General Knowledge and Text Production Knowledge

propositional coherence and lexical cohesion

Whole Text

Adjacent Co-text

Immediate Co-text

Collocational Span

present word choice

An assumption fundamental to the word choice scheme shown in Figure 2, is that propositional coherence, or the underlying semantic representation of the text, is mapped at the lexical level by word choices which form a cohesive network. This mapping may extend beyond the point of "present word choice," in the sense of potential or planned text production, or actual production in the case of revision of completed text. 'Present word choice' refers to the existential event with which we are concerned. This present word choice is made at its location within a collocational span (up to and including a clause or a combination of clauses in a sentence, occasionally even several sentences).

Another assumption suggested by Figure 2 is that the *complete* act of word choice can involve all of the levels shown, and when it does, the levels are involved either simultaneously or iteratively in some possible sequence of cognitive processing.

These correspondences include the word's conventional collocation(s) as well as its lexical-semantic relation (i.e., cohesion) with other lexemes throughout the text, its lexical-syntactic work within the immediate co-text of its containing phrasal/clausal frame, and its lexical-semantic meaning in relation to the logical meaning of its co-text, either at the phrasal/clausal (micropropositional) level, or at larger adjacent (macropropositional) co-textual levels, such as argument sequences, expository episodes, or the whole text.

Finally, there are some default assumptions, what Figure 2 leaves out, with which I am not concerned here because of their lack of construability or observability with only the information provided by the writer's text, although they are important to the application of the analytical categories being discussed. These involve the ESL writer's native language, text-topic knowledge, genre knowledge, thinking skills, and memory capacity. I will assume here that our ESL writer is 'ideal' in these ways for the following discussion, but will return to them briefly in my summary of word choice problems. Figure 3, below, is an attempt to summarize the descriptive categories, both superficial and complementary, as we might expect them most likely to relate to various levels of text:

Figure 3. Descriptive Categories and Textual Levels

	Superficial and Complementary Descriptive Categories				
	Pragmatic	Logical	Lexical-semantic	Collocational	Lexical-syntactic/ morpho-syntactic
Whole text	√ register	√	√ cohesion		
Adjacent co-text (multi-sentential)	√ text-deictic	√	√ cohesion	√	
Immediate co-text (up to sentential)	√ text-deictic		√ denotation, false cognates	√	√

In sum, there are three important tracks which may be relevant simultaneously. The first is categorial or descriptive, which includes many general categories of word choice effects. The second is the potential overlap or simultaneity of these categories

with each other. The third is that word choices must ultimately be analyzed at more than just the sentence level. This complexity makes it difficult to label the 'type' of problematic word choice without qualification. Usually, however, we can intuitively gauge the salience of one complementary category over another (i.e., its relatively larger contribution to a word's problematicity).

EXAMPLE ANALYSES OF PROBLEMATIC WORD CHOICES BY ESL WRITERS

Various theoretical perspectives have been, or could be, applied to the diagnosis of problematic word choices in writing. The brief survey above laid out what I think are the analytical perspectives which a comprehensive empirical study should be prepared to take into account. In examining the authentic ESL student examples below, some of these perspectives will naturally be invoked by the data at hand and some will not. Those which are most observable involve the syntactic, semantic, pragmatic, collocational, and logical aspects of word choice. I will focus on these. Those which may not be as observable simply from an inspection of the written product involve first language transfer effects, mastery of text-topic knowledge, and cognitive ability. I will return to these at the end of the paper. All of these constitute the principle descriptive categories of word choice effects which I believe can be applied in a practical manner toward the analysis of unsuccessful (or, for that matter, successful) ESL word choices in writing.

All of the following examples were selected from ESL student academic writing. Although there is not space here for a highly detailed account of these examples as they might relate to a larger, embedding text, they are intended to exemplify the major descriptive categories of problematic word choice (Fig. 3). It needs to be kept in mind that these categories may all, in principle, co-occur in various combinations. Further, other problematic word choices may be apparent in these examples, such as "use" in (10), and the reader is welcome to examine these as well.

(10) The researchers convincingly support their idea by re-examining the theories of Aristotle concerning philosophical inquiry. Perhaps owing to this use of classical philosophy, they present *organized* reasons for their position on this issue.

In (10), the salient problems with "organized" are both lexical-semantic and logical, involving an incongruity of meaning of the word *organized* with propositional content in the preceding, adjacent co-text (i.e., the first sentence). In (10), the denotation of the word choice does not fit logically with the writer's probable intended meaning because it is too general—to the point of incompleteness—in meaning. The writer needed some adjective which would help to explain in what way the researchers' position is 'convincingly supported' because of some philosophy-inspired argumentative structure which they acquired from studying Aristotle. This can be seen more clearly when a 'better' native speaker word choice is substituted, and then compared with the original (e.g., *well-organized* or *valid*). Although a successful revision would no doubt have to be more extensive than this single substitution, the point here is that the lexical-semantic requirements of particular word choices are conditioned upon their macropropositional as well as micropropositional environments. Now consider the next example:

(11) Rodents are the best fit mammalians for study because of their high rate of reproduction, *accessible* life spans, and relatively low cost.

In (11), the problem involves lexical-syntactic and lexical-semantic relations and connotations. In (11), the writer intended to explain why the life span of rodents is useful to laboratory scientists. I know this because I consulted the writer, a well-informed graduate student studying epidemiology. The word choice does not make sense because a "life span" can not be "accessible" (at least in English). This is a 'restricted combination' problem of lexical-semantic relations which hold for English, and is rather complex—as a derived nominal, 'accessible' assigns a theta role of AGENT, the identity of which (lab researchers) is not furnished. Furthermore, 'accessible' things must be 'openable' or 'enterable',

having structural or conceptual internal content. One might further maintain that there is a collocational problem (We will see a clearer example of this in (12) below). Usually, with word choice problems like this, the original grammatical structure must be abandoned and paraphrase should be considered as a solution. Sometimes, even a paraphrase will have to allow some of the information to be 'implied' (e.g., *short lives, (research-) amenable life spans, usefully [to researchers] short life spans, short and therefore useful [to researchers] average age limits because of the rapid availability of mature carcasses for dissection and analysis [by researchers]*).

The last example illustrates another important, but easily overlooked category of word choice problem, that of conventional collocation:

> (12) *Life* is an amazing *world* to biologists, revealing as it does that independent cells can cooperate with one another.

In (12), the problem is both collocational[7] and lexical-semantic. These two quite abstract words, *life* and *world*, occur in a roughly equational (copular) syntagmatic frame. The writer's meaning seems clear enough, but this collocation of 'life' and 'world' is very strange in English: there is no convention by which the general class denoted by the word *life* can be equated with the general class denoted by *world*. There is no lexical combinatory convention in English which might over-ride the lexical-semantic restriction against this novel equation of these two abstract nouns[8] (i.e., as in conventional metaphoric or idiomatic collocations, such as *life is a journey/an unfolding drama*). A practical approach is to see whether synonyms can be substituted or whether a minimal paraphrase would be satisfactory, e.g., instead of *world,* substitute *phenomenon* (which has weak collocability with *life*); or restructure the phrase: *The world of living things; The world's life* (at best, these are marginally satisfactory paraphrases). Conventional collocations generally pass unnoticed by the reader (or writer); contra-conventional ones generally will not.

T. F. Mitchell (1971) made the point long ago that in the absence of 'strong' collocational choices, the writer will generally attempt to retrieve a weaker, although still conventionally preferred, collocate, in order to make a communicatively familiar word choice:

> We are probably all aware of the operation of even weaker collocational constraints as we search for the 'right' choice among, say, *achieve*, *accomplish*, *effect*, *execute*, *implement*, *realize*, etc. to associate with *plan* or *project* or *proposal* or *ambition* or *object* or *objective*, and a certain inescapable 'prescriptivism' informing language choices is perhaps worthy of note in passing. (p. 54)

This particular prescriptivism is more than 'worthy of note' when it comes to the diagnosis of what ESL writers have written, as opposed to what they 'should' write, given the institutionalized collocational restrictions found, for example, in academic writing.

RESEARCH AND PEDAGOGICAL APPLICATIONS

When writing, ESL students make mistakes in word choice for reasons which are not clearly or systematically understood. Word choices may be 'odd' for subtle, perhaps opaque reasons. There is sometimes the added difficulty of knowing what the intended, 'real' meaning was. An attempt has been made here simply to provide a rational list of descriptive categories based on observable factors, at various levels of language use, which may serve as a foundation for analyzing or diagnosing word choice problems in ESL writing. The following list of diagnostically oriented 'word choice problems' is derived from the preceding discussions and is an attempt to create 'super-categories' which are closer to research and pedagogical applicability. It should be kept in mind that all of these are potentially relevant categories in a given case, as seen in the foregoing analyses of student writing samples. The list has two parts, the first one recapitulating the problems which can be construed reliably from an examination of the text in question, as illustrated above. The second part makes use of those categories which are not construable from the text alone.

Word Choice Problems Construable from the Written Text:

1. L2 COLLOCATIONAL knowledge is lacking, incomplete, or faulty (compared to native speaker knowledge).

2. L2 LEXICAL-SEMANTIC knowledge is lacking, incomplete, or faulty (compared to native speaker knowledge).

3. L2 LEXICAL-SYNTACTIC knowledge is lacking, incomplete, or faulty (compared to native speaker knowledge).

4. L2 LOGICAL. The proposition in which the word choice is embedded is not logical because of the word choice (either internally or in relation to co-textual propositional meanings).

5. PRAGMATIC. Included here are missing or inappropriate phoric reference and inappropriate register, especially overgeneralization from L2 conversational structures, including conversational strategies unsuitable for written discourse.

Word Choice Problems not Construable from the Written Text Alone:

6. L1 INTERFERENCE, grammatical and text-type knowledge. Not to be confused with word choice problems 4 or 5, this problem relates to L1 rather than L2 genre expectations: discourse moves, voice, register, and so forth. This may be the converse of word choice problem 5: L1 knowledge is being transferred because it sometimes works. I have conflated this pragmatic L1 area with L1 grammatical knowledge (see earlier discussion, "Superficial Descriptive Categories").

7. BACKGROUND KNOWLEDGE. The writer lacks general/"factual" knowledge related to the text topic (i.e., the person making the word choice has an inaccurate meaning to express).

8. COGNITIVE ABILITY. The fault is in episodic memory or problem-solving skills (i.e., the person making the word choice has no well-formulated meaning to express).

The potential usefulness of my presentation of both a detailed survey of theoretical categories and some attempts at applying them to real examples is clear enough, I expect, to ESL instructors interested in expanding their abilities to cope with the recurring word choice problems of their students. I hope that this discussion will provide a starting point, or at least a provocation, for further research into the possibilities of pedagogically utilizing ESL written word choice strategies and processes in effective ways. Such research could delve into the issues of production vocabulary acquisition, the effects of consciousness-raising about word choice in ESL student writing, the effectiveness of syllabus materials based on such knowledge, the question of 'made-up' versus simplified/unsimplified authentic materials used in teaching writing, the use and abuse of dictionaries and thesauri, and the clarification of logical coherence and lexical cohesion in writing. Sensitizing the writer to his or her own abilities and needs concerning word choice in writing can also be constructive. The basic pedagogical implication of this study, then, is that a systematic understanding of ESL student written word production is possible to achieve, and can provide a basis for diagnosing student word choice errors so long as the complex interactions of discourse, syntax, and vocabulary are not ignored.

It seems that a comprehensive inquiry requires that several research approaches be applied to ESL writing, and in a certain cumulative, iterative sequence: first, the development of a tentative analytical framework based on the extant literature along the lines discussed in this paper (this would include a working typology of word choice problems and one of word choice, or production, strategies); second, applying and then modifying or expanding this framework by examining word choice problems as they emerge from the analysis of actual ESL writing; third, a study of textually controlled word choice elicitations (e.g., by use of cloze elicitations) with further refinements to the analytical framework; fourth, the application and testing of this framework with real-time data, such as think-aloud (a running student commentary on their thoughts while writing), introspection (immediate or delayed student recollections), or interview data; and fifth, pedagogical application and testing.

NOTES

[1] See Meara (1984) and Laufer (1986) for discussions.

[2] This information was developed from data collected at the UCLA ESL Service Courses as the preliminary investigative groundwork for Leech (1993a).

[3] Example from Swan and Smith (1987, p. 87).

[4] Example from Swan and Smith (1987, p. 234).

[5] Nonetheless, these effects may constitute a part of the explanation for the more baffling sorts of ESL word choices, along with considerations of idiomaticity and metaphor (especially those involving language-specific lexical-semantic systems--these may be among the least understood linguistic phenomena; for a theoretical understanding of such events, one might turn to thinkers such as Benjamin Whorf, but these are issues beyond the scope of this paper).   The L2 lexical-syntactic and lexical-semantic systems, in this case those of English, may not be completely or appropriately indexed to particular lexical items which the ESL writer has available in his or her productive vocabulary.   That is, an L2 word's syntactic and semantic behavior may have been incompletely or inaccurately acquired, either relative to the writer's own interlanguage or to a normative model of native-speaker English.

[6] By lexical-syntactic systems, I am referring here chiefly to morphological and selectional restrictions, semantic role assignments, and subcategorizations, although other things, such as adjunctive modification, aspect, modality, and factivity might be included.

[7] *Collocations*, in the Firthian sense used here (although I would include conventional metaphors and idioms as types of collocation). Collocations generally occur within phrasal and sentential boundaries. See Sinclair (1991) and Hoey (1991) for more on this traditional view, as opposed to Halliday and Hasan's (1976, 1989) usage in terms of lexical-semantic relations in 'cohesion'.

[8] According to the L2 writer, the corresponding Chinese collocation is fine, which suggests the notion of 'false collocational cognates'.

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David Leech is a Ph.D. candidate at UCLA's Department of TESL/Applied Linguistics. His central interest is the investigation of conventionalized lexical-grammatical structures used in texts, as they relate to language acquisiton and use.

Essay Prompts and the ESOL Student

Andrea G. Osburne
Central Connecticut State University
Sylvia Mulling
Kean College of New Jersey

Recent research on writing prompts which fit the preferences of English NS writers has found that NS writers prefer prompts in question form (Brossell & Ash, 1984) and that anticipating a good grade will positively influence writers' choices (Hayward, 1988). Little is known about whether this applies to L2 writers, however. The present study surveyed 142 ESOL students for their preferences as to form of prompt, and also surveyed for other factors relating to their choices such as perceived difficulty of a topic. Each student used a 5-point Likert scale to respond to ten potential prompts. The data were then analyzed using ANOVA, correlation analysis, and multiple regression analysis. No statistically significant difference was found in students' preference for prompts in different forms (question or statement). However, perceived ease, degree of interest, and potential prolificacy of prompt individually and as a group correlated strongly with students' preferences. It seems that ESOL students, while perhaps not alert to potentially helpful syntactic clues in prompts, are nonetheless probably using appropriate strategies when given a choice of prompt to write on.

ESSAY PROMPTS AND THE ESOL STUDENT

During the past ten years, much research has been done on the form and type of essay questions or other writing prompts which ought to be used in testing situations to fit student preferences and maximize the quality of the resulting writing, where the students to be tested are native speakers of English. For example, it has been found that though they may not write better in response to them (Brossell & Ash, 1984), students definitely prefer prompts which contain direct questions (Hayward, 1988); it has additionally been found that prompts consisting of a background statement and a

statement or question involving instructions rather than either just a bare topic or an elaborate scenario also fit students' preferences and abilities best (Hoetker, 1982; Brossell, 1983). And in a detailed study of native speakers' perceptions about a prompt, Hayward (1988) found that factors such as believing that they would get a good grade or find a lot to say about a prompt positively influenced students' choices. Very little is known about whether any of this applies to non-native speakers of English, however. In a study of non-native speakers taking a standardized essay test in Canada, Chiste and O'Shea (1987) found that when presented with optional topics, non-native speakers tended to choose either the first topic or the shortest one, but Chiste and O'Shea were unable to either distinguish these two factors from each other or account clearly for the preference displayed. And Hirokawa and Swales (1986), in a study comparing students' performance when given prompts written in formal or in informal language, found no clear difference in quality.

The present study surveyed a large sample of ESOL students to attempt to determine their preferences as to question or statement form of prompts; for this analysis, then, the issue of form of prompt functioned as the independent variable while students' selection functioned as the dependent variable. It was hypothesized that ESOL students would match native speakers' preference for direct questions. As a supplement, in an attempt to address content of prompt in addition to form, as did Hayward (1988), students were also surveyed for other factors which might relate to their choices such as perceived difficulty of a topic or perceived degree of interest; these factors functioned as supplementary independent variables. Again, it was hypothesized that ESOL students would match native speakers' preferences.

METHOD

One-hundred-forty-two ESOL students at various New Jersey and Connecticut colleges and universities who were advanced enough in English to understand the prompts and survey form (as judged by their instructors), had some experience writing essays in English, and were willing to participate were asked to fill out

questionnaires in which they rated ten prompts. Students were asked to read each prompt and then use a 5-point Likert scale to indicate the extent of their agreement with the statement "I might choose this essay question if given a choice" (Hayward, 1988). The ten prompts in each student's packet were based on ten topic areas (money, animals, etc.) selected from Powell (1981). Actually, there were two different prompts, an *a* prompt and a *b* prompt, written for each topic area, and each individual prompt was also written in two alternate forms, a question form (Q) and a statement form (S). For example, for two topic areas, education and health, the following eight prompts were used:

Education
1.a.S. Most students attend college because they expect education to improve their lives. Discuss this expectation.

1.a.Q. Most students attend college because they expect education to improve their lives. Does a college degree guarantee a better life for graduates?

1.b.S. People usually find that education changes them in ways other than just learning more. Discuss the effect that education is having on you.

1.b.Q. People usually find that education changes them in ways other than just learning more. What effect is education having on you?

Health
4.a.S. "A healthy mind in a healthy body" is the key to fitness today for many people. Discuss ways to achieve this.

4.a.Q. "A healthy mind in a healthy body" is the key to fitness today for many people. How can people achieve this?

4.b.S. Since smoking makes people sick, not smoking is a good health habit. Describe some other good health habits.

4.b.Q. Since smoking makes people sick, not smoking is a good health habit. What are some other good health habits?

Although there were, then, actually forty prompts in all, no student had to respond to more than ten, or to more than one prompt in a particular topic area. Neither did any student have to respond to the same prompt in both its question and statement forms. A typical packet thus included ten prompts, five in question form and five in statement form, with the order of the prompts randomized. As

mentioned earlier, in an attempt to examine content factors relating to students' choices, students were also asked to respond to eight additional statements about each prompt, using the same Likert scale. All but the first of the additional statements were based on the Hayward (1988) study of native speakers' preferences and follow:

1. I understand this essay question.
2. The essay will be easy to write.
3. The essay will be interesting to write.
4. It is easy to see what the teacher is looking for.
5. It would be easy to organize this essay.
6. I would probably express a lot of my own personal ideas here.
7. I would probably find a lot to say in this essay.
8. I might get a good grade on this essay.

Prompts ranged in length from 13 to 41 words (a considerably smaller length difference from that found in the study by Chiste and O'Shea cited above, and one which turned out to have no significance when ANOVA was performed).

After the questionnaires were collected, three had been left blank and were discarded. The remaining 139 packets were checked to determine whether any statements about any prompt had been omitted from response; 27 prompts out of the 1390 total exhibited such incomplete responses and were also removed from further analysis. The remaining data (1363 items) were analyzed using standard statistical procedures such as ANOVA, correlation analysis, and multiple regression analysis.

RESULTS

As shown in Table 1, ANOVA, a test to detect significant variance, indicates no statistically significant difference in the mean scores of question forms of prompts as opposed to their statement forms (since the computed F-Ratio [$F_{1,1361}$ =.06] is smaller than the critical F-Ratio [3.85]) at the .05 level of significance).

Table 1: Statement Form vs. Question Form of Prompts

	Statement form	Question form
Sample size Total = 1363	687	676
Total score	2240	2194
Mean	3.26	3.25
Standard Deviation	1.13	1.10

ANOVA for statement form vs. question form

Source	df	SS	MSS	F-ratio
Between forms	1	.08	.08	$F_{1.1361} = .064$
Residual	1361	1697.60	1.24	

Total 1697.68
Critical F-ratio: $F_{1.1361} = 3.85$ at $p < .05$
Note: Total scores were obtained by adding individual scores on the 5-point Likert scale.

The eight statements additionally included in the survey to study content factors were all checked for individual correlations with students' statements of preference for particular prompts in order to see whether there would be any relationship; see correlation coefficients in Table 2. All eight statements were found by t-test to have correlations that were statistically significant with students' statements of preference for particular prompts, since all computed t values were well above the critical t value of 2.33 at the .01 level of significance, as shown in Table 3.

The three statements which correlated most highly with students' statements of preference were 2, 3, and 7, concerned respectively with perceived ease of prompt, degree of interest of prompt, and potential prolificacy of prompt. The respective squares of the correlation coefficients r^2 were .395 (meaning that 39.5% of the variance could be explained by this factor alone), .442 (44.2%), and .430 (43%; Table 4).

Table 2:   Correlation Matrix of the Eight Content Factors with Statement of Preference

	SC	S1	S2	S3	S4	S5	S6	S7	S8
SC	1.00								
S1	.433	1.00							
S2	.628	.518	1.00						
S3	.664	.414	.542	1.00					
S4	.477	.484	.512	.408	1.00				
S5	.555	.457	.648	.464	.580	1.00			
S6	.545	.430	.543	.507	.455	.545	1.00		
S7	.655	.449	.606	.626	.501	.612	.658	1.00	
S8	.590	.457	.623	.532	.531	.605	.593	.648	1.00

Summary of data

	SC	S1	S2	S3	S4	S5	S6	S7	S8
Mean	3.26	4.21	3.44	3.62	3.60	3.35	3.56	3.42	3.31
SD	1.11	0.92	1.05	1.05	0.94	0.99	1.14	1.06	0.88

Note: SC = statement of preference for a particular prompt.
S1-S8 represent the eight content factors in statements 1 to 8.

Table 3:   Computed t Values of Correlation Coefficients: Eight Content Factors and Statement of Preference

	SC	S1	S2	S3	S4	S5	S6	S7	S8
SC									
S1	17.75								
S2	29.81	22.38							
S3	32.83	16.81	23.81						
S4	20.05	20.45	22.04	16.52					
S5	24.67	18.96	31.39	19.36	26.30				
S6	24.04	17.58	23.86	21.75	18.85	23.98			
S7	32.04	18.56	28.15	29.62	21.36	28.58	32.30		
S8	27.01	18.96	29.44	23.23	23.12	28.09	27.19	31.46	

Degrees of Freedom df = 1361
Critical t value at p < .01 is 2.33

Table 4: Squares of the Correlation Coefficients—r^2

	SC	S1	S2	S3	S4	S5	S6	S7	S8
SC	1.00								
S1	.188	1.00							
S2	.395	.269	1.00						
S3	.442	.172	.294	1.00					
S4	.228	.235	.263	.167	1.00				
S5	.309	.209	.420	.216	.337	1.00			
S6	.298	.185	.295	.258	.207	.297	1.00		
S7	.430	.202	.368	.392	.251	.375	.434	1.00	
S8	.349	.209	.389	.284	.282	.367	.352	.421	1.00

Stepwise multiple regression analysis, a procedure intended to establish mathematical relationships among independent variables (Hogg & Tanis, 1993, pp. 499-509; Woods, Fletcher, & Hughes 1986, p. 243) and determine whether their interaction or combined effect explains more variance than their independent action, was then applied to the eight statements. As shown in Table 5, stepwise multiple regression analysis indicated a squared multiple correlation of $R^2 = 58\%$ between students' preference and statements 3, 7, and 2 taken as a group. The 58% figure means that the combined effect of the prompt's degree of interest, potential prolificacy, and perceived ease accounted for that proportion of the variance, or that, in effect, the greater part of students' preference for a particular prompt can be explained by the effect of these three factors combined. Other factors as expressed in statements 1, 4, 5, 6, and 8 do not appear in the table because they contributed only minimally to the reduction of the variance (the computed F-ratio of each was well below the critical F-ratio of 6.63).

Table 5:   Results of Stepwise Multiple Regression Analysis: Squared Multiple Correlation at Various Steps

Step	Content factors	R^2	% increase	F-ratio
1	Degree of interest (Statement 3)	44.2%	44.2%	
2	Potential Prolificacy (Statement 7)	53.5%	16.8%	16.8
3	Ease (Statement 2)	58.0%	9.6%	9.6

Note: Critical F-ratio: $F_{1.1361} = 6.63$ at $p<.01$
Nonsignificant content factors: S8 ("I might get a good grade on this essay"), S1 ("I understand this essay question"), S4 ("It is easy to see what the teacher is looking for"), S5 ("It would be easy to organize this essay"), and S6 ("I would probably express a lot of my own personal ideas here").

DISCUSSION

The findings of this study show students using consistent strategies to make decisions about prompts when they are given a choice, strategies which are likely to enhance their chances for success. Considering factors such as whether it will be possible to find enough to say about a topic should indeed be a good test-taking strategy (of course, it is impossible on the basis of this study to assess the soundness of students' judgment in these matters). The Hayward study found that the factor which most strongly correlated with students' preference for a particular prompt was whether they perceived that a good grade might result; other strongly correlating factors were perceived ease, degree of interest, and potential prolificacy. These are the same three factors which surfaced in the present study as determiners of students' choices, but note that in the present study perceived good grade, while correlating with preference for a prompt in a statistically significant way, did not show as strong a correlation as the three other factors (and, if added to the multiple regression involving perceived ease, interest, and degree of prolificacy, actually adds less than 1% to the total explainable variance). It seems that ESOL students, while logically

concerned about grades, as native speakers of English are, have a more immediate concern based on language proficiency, whether they will be able to write about the topic at all, and this is what the three factors apparently reflect. Note that ability to understand a topic, a related factor which was not included in the Hayward study, only correlated weakly with students' preferences; apparently all the topics presented were considered more or less comprehensible by the subjects, so that the issue was not particularly relevant.

Another factor which correlated only relatively weakly with students' preferences was use of personal ideas, expressed in Statement 6 ("I would probably express a lot of my own personal ideas here"). This conforms to frequent stereotypes of many groups of ESOL students by teachers. In the Hayward study, contrary to frequent stereotypes of native speakers of English as being all too eager to write papers full of personal ideas, this factor was not particularly strong either. Native speakers of English and ESOL students may have more in common in this area of choice than is often supposed.

The findings of this study also indicate that ESOL students differ from native speakers in their selection of the form of essay prompts. Prompts with direct questions are preferred by native speakers, perhaps because they consider them to be readily convertible into thesis statements (Hoetker, Brossell & Ash, 1982, p. 6). ESOL students seem to be unaware of this possible advantage, and thus show no statistically significant preference for prompts with direct questions. Perhaps ESOL writing teachers could usefully make special efforts to acquaint their students with the potential convenience of such prompts.

CONCLUSION

Prompt development, whether engaged in by writing teachers or writing test administrators, is a complex process which is nevertheless only partially accountable for outcomes. Other variables such as raters' criteria for evaluation and writers' background and expectations may also play a role. Nevertheless, the prompt is an important variable which deserves consideration in its own right.

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APPENDIX: LIST OF PROMPTS

1.a.S. Most students attend college because they expect education to improve their lives. Discuss this expectation.

1.a.Q. Most students attend college because they expect education to improve their lives. Does a college degree guarantee a better life for graduates?

1.b.S. People usually find that education changes them in ways other than just learning more. Discuss the effect that education is having on you.

1.b.Q. People usually find that education changes them in ways other than just learning more. What effect is education having on you?

2.a.S. Hundreds of years ago many people believed that the Earth was flat. Give examples of other earlier ideas that people don't believe anymore.

2.a.Q. Hundreds of years ago many people believed that the Earth was flat. What else did many people believe in the past that we don't believe anymore?

2.b.S. In the twentieth century, science has greatly increased our understanding of the world, but there are still many things we do not know. Discuss the possibility that some things may never be explained by science.

2.b.Q. In the twentieth century, science has greatly increased our understanding of the world, but there are still many things we do not know. Do you believe that some things will never be explained by science?

3.a.S. In some countries, people are not free to say or write whatever they wish because of government control. Discuss your opinion of this situation.

3.a.Q. In some countries, people are not free to say or write whatever they wish because of government control. What is your opinion of this situation?

3.b.S. Some people say that freedom is too much for many people to handle because they don't know how to use it wisely. Give your opinion of this statement.

3.b.Q. Some people say that freedom is too much for many people to handle because they don't know how to use it wisely. What is your opinion of this statement?

4.a.S. "A healthy mind in a healthy body" is the key to fitness today for many people. Discuss ways to achieve this.

4.a.Q. "A healthy mind in a healthy body" is the key to fitness today for many people. How can people achieve this?

4.b.S. Since smoking makes people sick, not smoking is a good health habit. Describe some other good health habits.

4.b.Q. Since smoking makes people sick, not smoking is a good health habit. What are some other good health habits?

5.a.S. Rats, skunks, and rattlesnakes are examples of animals which many people do not like. Identify and discuss an animal which you do not like.

5.a.Q. Rats, skunks, and rattlesnakes are examples of animals which many people do not like. What is an animal which you do not like?

5.b.S. The world has a number of unusual animals. Write about an unusual animal that you are familiar with.

5.b.Q. The world has a number of unusual animals. What is an unusual animal that you are familiar with?

6.a.S. Some people say that people in the U.S. think about money too much and want too many things. Discuss your opinion of this statement.

6.a.Q. Some people say that people in the U.S. think about money too much and want too many things. Why do you think this is true or untrue?

6.b.S. A famous proverb says that "Time is money." Explain the meaning of this proverb.

6.b.Q. A famous proverb says that "Time is money." What does this proverb mean?

7.a.S. Joseph Hall said, "Perfection is the child of Time." Explain the meaning of this quotation.

7.a.Q. Joseph Hall said, "Perfection is the child of Time." What does this quotation mean?

7.b.S. A proverb says that it's smart to learn from your own mistakes, but smarter to learn from the mistakes of other people. Explain the meaning of this proverb.

7.b.Q. A proverb says that it's smart to learn from your own mistakes, but smarter to learn from the mistakes of other people. What does this proverb mean?

8.a.S. Different countries offer different economic opportunities. Describe a good way to earn a lot of money in your country.

8.a.Q. Different countries offer different economic opportunities. What is a good way to earn a lot of money in your country?

8.b.S. Many people who win a lot of money in lotteries or contests continue to go to their jobs each day, even though they no longer need the money. Explain possible reasons for this decision.

8.b.Q. Many people who win a lot of money in lotteries or contests continue to go to their jobs each day, even though they no longer need the money. Why would anyone want to work if he or she didn't have to?

9.a.S. Many natural resources like oil and water are becoming scarcer and more expensive. Discuss this problem.

9.a.Q. Many natural resources like oil and water are becoming scarcer and more expensive. Why is this a problem?

9.b.S. Many people today are concerned about pollution of our air, water, and other resources. Discuss the most serious pollution problem we face.

9.b.Q. Many people today are concerned about pollution of our air, water, and other resources. What is the most serious pollution problem we face?

10.a.S. The first memory which a child has often concerns an important experience or event. Explain the significance of your earliest memory.

10.a.Q. The first memory which a child has often concerns an important experience or event. What is the significance of your earliest memory?

10.b.S. Some people seem to be better at remembering things than other people are. Explain the possible reasons for this.

10.b.Q. Some people seem to be better at remembering things than other people are. Why could this be true?

Andrea G. Osburne is a professor of linguistics at Central Connecticut State University, where she additionally serves as coordinator for the TESOL M.S. program. She has also taught in graduate TESOL programs in the People's Republic of China.

Sylvia Mulling has taught English for over thirty years in Puerto Rico, Algeria, and the People's Republic of China. She is an assistant professor of English at Kean College of New Jersey and is a TESOL delegate to the United Nations.

What Lurks in the Margin:
Use of Vocabulary Glosses as a Strategy in Second Language Reading

George M. Jacobs
SEAMEO Regional Language Centre, Singapore

There have been inconsistent findings in previous second language research on the effect of vocabulary glossing on reading comprehension (Davis, 1989; Jacobs, Dufon, & Fong, 1994; Johnson, 1982; Pak, 1986). The present study was undertaken to extend this body of research in two ways: (a) by including another set of second language learners, another text, and another set of vocabulary glosses, accompanied by rigorous experimental procedures; and, (b) by considering the possible interaction of other variables with glossing. These other variables were: psychological type, tolerance of ambiguity, proficiency, frequency of gloss use, perceived value of gloss use, and time on task.

Glossing can be situated in the context of recent work on the reading process (Eskey, 1988; Lesgold & Perfetti, 1981; Rumelhart, 1980; Stanovich, 1980) and learning strategies (Cohen, 1990; O'Malley & Chamot, 1990; Oxford, 1990; Wenden, 1991). Glossing strengthens the bottom-up component of the reading process. The use of glossing is one of several possible repair strategies that readers can use when they recognize comprehension breakdowns.

One hundred sixteen U.S. college students enrolled in a third-semester Spanish course participated in the study. They were randomly assigned to one of two conditions, with half reading an unglossed Spanish text and half reading the same text accompanied by English glosses. After reading the text, participants were asked to write as much of the text as they could recall. Results showed a significant effect for glossing but no significant interactions between the treatment and any of the other variables. Suggestions are made as to the optimal use of vocabulary glosses.

INTRODUCTION

Vocabulary glosses are common in second language (L2) instructional materials (Bernhardt, 1991; Davis, 1989; Holley & King, 1971; Jacobs, 1991). A vocabulary gloss can be defined as a

short definition (Nation, 1983) or an explanation of the meaning of a word (Pak, 1986). Often glosses are written in the L2 students' native language, but they may also be in the L2. The example below illustrates a hypothetical gloss designed to facilitate the reading of Spanish by beginning level English-speaking students. Here, the gloss appears in the margin.

Pedro **compra** dos tacos.   **buys**

While vocabulary glosses are the only type of gloss examined in the current study, other types of glosses can be found in instructional materials. For example, question glosses can be an effective means of enhancing students' retention of what they read (Hamilton, 1985).

Glosses seem to be used for several purposes, the most important of which are to assist reading comprehension (Nation, 1983, 1990) and to aid vocabulary learning (Holley & King, 1971). These reasons are, of course, complementary because, as many scholars believe, comprehensible input is a necessary prerequisite of language acquisition (e.g., Krashen, 1985). Further, students appear to want glosses, as was found in two studies in which U.S. university L2 students were asked whether or not they wanted their texts to be glossed (Holley, 1970; Jacobs, Dufon, & Fong, 1994).

Nation (1983, 1990) cites four advantages of glossing which support its possible comprehension-enhancing functions. First, glossing supplies readers with instant knowledge about the meanings of words which are important to the comprehension of a particular text but which may not be important to the language as a whole (i.e., glossing provides definitions of low frequency words). As Parry (1993, p. 2) states, "Vocabulary teaching takes a good deal of time, and it is simply not economic to spend precious minutes on items whose chances of reoccurrence are only ten in a million." A second advantage presented by Nation is that glosses lessen the disruption of the reading process resulting from students looking up words in a dictionary or asking the teacher or other information sources for help. Third, glosses make students less dependent on the instructor for definitions. Thus, they are better able to read on their own and teachers are freed to help students with aspects of the reading other than vocabulary. Fourth, glossing allows for greater individualization, because different students will have problems with

different vocabulary items. Students only need to look at a gloss when they do not know a particular vocabulary item.

Holley and King (1971) hypothesize two further advantages for glossing in terms of how it may aid vocabulary acquisition. The first advantage is derived from studies reported in Anderson, Faust, Roderick, Cunningham, and Andre (1969) in which prompting increased scores in paired associate studies. From this, Holley and King surmise that by providing students with the correct meaning of unknown vocabulary, glosses help students avoid incorrect guesses which could result were they left with only context to guide them. The difficulty of deriving meaning from context has been emphasized by several researchers (e.g., Jenkins & Dixon, 1983; Nation, 1990; Parry, 1986, 1987; van Daalen-Kapteijns & Elshout-Mohr, 1981). Thus, glossing promotes more accurate understanding of vocabulary.

Holley and King's second hypothesis as to how glossing can assist vocabulary acquisition is that learning is aided by the rehearsal involved as students return to the text after looking at the gloss. In other words, students leave the text to check the gloss of the unknown vocabulary. They may then repeat the word or phrase to themselves in order to hold the meaning in memory until their focus is back at the place in the text where they originally encountered the previously unknown vocabulary. The rehearsal involved in this process may help students learn the vocabulary.

Twaddell (1973) provides an additional argument for the use of glossing, though he terms it "a necessary evil." Since the overwhelming majority of words in a language appear in low frequencies and, thus, remain unknown to learners until they reach high levels of proficiency, selecting comprehensible reading materials for beginning or intermediate level learners is very difficult without the use of glosses:

> Anything that such a learner could read . . . would have to be so childish as to be an insult to his maturity. Anything that would be interesting and worth reading . . . would require a much larger vocabulary than is available, so that tremendous sacrifice in either speed or comprehension would have to be made (p. 65).

Similarly, emphasis on the use of authentic texts in L2 instruction often presents learners with a daunting comprehension

challenge for which glossing may provide some assistance. However, many scholars (e.g., Rivers, 1987) believe that students must be exposed to the L2 in the same way that native speakers of that language see and hear it. For example, in the preface to one intermediate Spanish text for native speakers of English which employs glossing (Marks & Blake, 1989, p. xvii), the authors state that, "[a]uthenticity is the first pillar" of their book. These scholars assert that materials written especially for learners of a language, while attempting to make comprehension easier, often do just the opposite. Nonauthentic texts, they believe, deprive students of exposure to the language in all its richness.

The chief alternatives to authentic texts are texts which are modified syntactically, lexically, and stylistically or texts written especially for L2 learners. Modifications most often take the form of simplification of language (Tickoo, 1993); thus, simplified texts reduce or eliminate the need for vocabulary glosses. Simplified texts also provide students with the opportunity to do a lot of extensive reading (Bamford, 1984). Many reading experts believe that doing large amounts of extensive reading is the key to developing vocabulary. L1 research evidence for the contribution of reading to vocabulary acquisition is reported by Nagy, Anderson, and Herman (1987), and Nagy, Herman, and Anderson (1987). L2 research evidence is found in studies by Day, Omura, and Hiramatsu (1990), Ferris (1988, cited in Pitts, White, & Krashen, 1989), and Pitts, White, and Krashen (1989). Defenders of simplification believe that getting students "hooked on books" (Fader & McNeil, 1968) written in their L2 may be easier if the difficulty level of the texts students have available to them is more or less attuned to their proficiency level.

However, given the types of objections to simplification mentioned above, glossing remains a possible means for helping learners access more complex texts. At the same time, the limitations of glossing must also be kept in mind. The typical gloss only assists readers with L2 vocabulary. Other areas which are also crucial to comprehension are not treated by most glosses. Inadequate knowledge of L2 syntax, not of vocabulary, was found to impair reading in two studies (Berman, 1984; Cooper, 1984). Carrell (e.g., 1988) has repeatedly stressed the importance of background knowledge in L2 reading comprehension. Thus, even

if, with the help of glosses, readers understand all of the words in a text, there remain other factors which might inhibit comprehension.

Glossing's Place in Models of the Reading Process

Many students and teachers alike assume that glosses facilitate comprehension. Davis (1989, p. 41) states that, "Textbook writers maintain that glosses are necessary for fluent reading of a foreign language text." However, theoretical models of the reading process provide differing vantage points from which to assess the value of glossing. Furthermore, studies of the effects of glossing have produced contradictory results on measures of comprehension.

Various views of the reading process place glossing in different lights. According to a bottom-up view, glossing contributes to comprehension because knowledge of each word is used to construct an understanding of the overall text. From a top-down perspective (Goodman, 1967; Smith, 1971), however, glossing may interfere with comprehension. When readers disrupt their reading to look at a gloss, the focus on individual vocabulary items, rather than larger conceptions of content and rhetorical mode, may interfere with the creation of an overall mental representation of the text linked with readers' current knowledge bases.

An interactive view of reading (Eskey, 1988; Lesgold & Perfetti, 1981; Rumelhart, 1980; Stanovich, 1980) combines bottom-up and top-down perspectives, viewing both information from the text and from readers' minds as essential to comprehension. As Vaughan and Estes (1986, p. 11) propose, "Reading is thinking cued by text." While interactive models restore to glossing some of the prominence denied it by top-down perspectives, these models suggest that other, top-down sources of information may sometimes be able to substitute for glosses. For example, knowledge about the content area of particular texts can assist readers in using context to derive the meanings of unknown vocabulary items.

Glossing and Learner Strategies

Glossing can be viewed in the light of recent work on L2 learner strategies (Cohen, 1990; O'Malley & Chamot, 1990; Oxford, 1990; Wenden, 1991). While different researchers in this

area have different classification schemes, glosses are generally seen as a resource to which learners can turn when they have recognized a comprehension breakdown while reading. For example, Cohen (1990) posits four categories of reading strategies used by second language learners: support strategies, paraphrase strategies, strategies for establishing coherence in text, and strategies for supervising strategy use. Included among the latter are strategies for identifying misunderstandings. Once a misunderstanding is identified, learners can turn to support strategies, among which Cohen includes the use of a glossary. Oxford's (1990) slightly different categorization scheme labels the identification of misunderstandings as a metacognitive strategy and the use of resources, such as glosses, as a cognitive strategy. At the same time, both Cohen and Oxford list other possible strategies for overcoming misunderstandings.

Blohm (1987) puts glossing in the context of research on metacognition. He views the use of glosses as a possible fixup strategy conducted by readers when their comprehension monitoring detects a lack of understanding (Baker & Brown, 1984; Flavell, 1981). According to Blohm, good readers take four ordered steps to repair a perceived lack of understanding: (a) rereading, (b) looking ahead, (c) utilizing a study strategy which promotes deeper processing (e.g., paraphrasing), and (d) turning to outside help. Clearly, referring to a gloss would fit into the last step. Citing Collins and Smith (1980), Blohm believes that with each succeeding step, the amount of disruption to the reading process increases. While utilizing extratextual assistance such as glosses may be the most disruptive type of fixup activity, Blohm states that it may be necessary when readers lack sufficient knowledge or reading skills to implement the other steps successfully (Alessi, Anderson, & Goetz, 1979).

Glossing's impact on second language comprehension has been investigated in at least four studies involving English (Johnson, 1982; Pak, 1986), French (Davis, 1989), and Spanish (Jacobs, Dufon, & Fong, 1994). In three of these, Jacobs, Dufon, and Fong (1994), Johnson (1982), and Pak (1986) found no differences in overall comprehension between L2 students who read glossed and those who read unglossed versions of the same passages, although Jacobs, Dufon, and Fong found that students whose L2 achievement was at least 0.8 standard deviations above

the mean were able to benefit from vocabulary glosses. Perhaps they were able to do so because their higher proficiency level enabled them to make fuller use of the assistance glossing provided, whereas, even with the glosses, lower proficiency students were not able to comprehend, let alone recall much of the text. Davis (1989) found comprehension higher among L2 learners who read glossed versions of the same texts.

Research Questions

Based on the above review of relevant literature, the following questions arise:

1. Does glossing lead to greater L2 reading recall?
2. Do other variables (e.g., proficiency, psychological type, tolerance of ambiguity, time on task, frequency of gloss use, and the perceived usefulness of glosses) interact with glossing to affect reading recall?

METHODS

In order to shed further light on the impact of glossing on recall the present study examines the potential interactive effects of text variables, learner variables, and situational variables and investigates the impact on recall of variables representing each of these three general categories. The effect of the presence or absence of vocabulary glosses in a text of a given readability level was examined as a text variable. The learner variables examined are proficiency (Jacobs, Dufon, & Fong, 1994), psychological type (Ehrman & Oxford, 1988; Jung, 1923; Myers, 1962), tolerance of ambiguity (Frenkel-Brunswik, 1949; Ely, 1988; 1989), and reading strategy (Baker & Brown, 1984; Hosenfeld, 1979). The time students took to read the assigned text was recorded as a situational variable (Bernhardt, 1983; Kintsch, Kozminsky, Streby, McKoon, & Keenan, 1975).

Two of the learner variables, psychological type and tolerance of ambiguity, deserve further explanation. In the first half of this century, Jung (1923) speculated that people fall into several distinct

categories with regard to psychological type. Inspired by Jung's theory, Myers (1962) proposed that people differ along four bi-polar dimensions: (a) extraversion-introversion (EI), (b) sensing-intuition (SN), (c) thinking-feeling (TF), and (d) judging-perceiving (JP). To measure these differences, Myers created the Myers-Briggs Type Indicator (MBTI), a self-rating scale.

According to type theory, extraverts prefer interaction with others, while introverts favor more solitary activities. Sensing types have a preference for the concrete, while an intuitor prefers the abstract. Those on the thinking end of the thinking-feeling continuum tend toward the objective and the impersonal, while those on the feeling end of the scale lean more toward the subjective and the personal. Finally, judgers prefer to live an organized, regulated life, whereas perceivers are more attracted to spontaneity and flexibility.

Budner (1962, p. 29) defines intolerance of ambiguity as, "the tendency to perceive . . . ambiguous situations as sources of threat." Ely (1989) developed a scale for measuring tolerance of ambiguity among L2 students and used it to examine the relationship between tolerance of ambiguity and learning strategies. A significant positive relationship was found between tolerance of ambiguity and (a) looking for overall meaning in reading, and (b) proofreading for spelling and accent marks. There was a significant negative relationship between tolerance of ambiguity and (a) looking for similarities between new words and L1 words, (b) looking up words in the L1 right away when reading, (c) focusing on individual language elements, and (d) asking the teacher for the right word when speaking. Ely's findings suggest that learners who are less tolerant of ambiguity would most often use and benefit from vocabulary glosses.

Participants

Participants in the current study were a convenience sample of 116 third semester students of Spanish as a Second Language enrolled in one of nine sections of Spanish 201 at the University of Hawai'i at Manoa. Seventy-eight of the participants were women, 38 were men. None of these students was a native speaker of Spanish.

The Text

Four criteria were used in selecting the text. The first was that the text be on a topic about which all of the participants in the study would have some background knowledge (Carrell, 1983). The text chosen (Cova, 1981, found in Kupferschmid & Dorwick, 1990) was about electric toys which do not work properly. The second criterion was length. A very short text would not provide sufficient data to access comprehension. Nevertheless, the passage had to be short enough so that participants would have sufficient time within a 50-minute class period for multiple readings, if they desired, in addition to time to write the recall of what they had read and complete the tolerance of ambiguity, frequency of use, and usefulness scales. The toy text contained 483 words. The third factor in selecting a text was that it be authentic (Davis, 1989).

The final criterion involved the inclusion of vocabulary items which were both relevant to the overall meaning of the text and beyond the current knowledge of many students (i.e., a text was sought for which glossing would significantly impact comprehension). At the same time, a text with too many unknown words might prove too daunting, even with the help of glosses. Pilot testing with a similar group of students revealed one text to be too difficult. When the text that was eventually selected had reached the point of being the probable choice, it was field tested with a group of students taking the same course. The field test involved asking students to read the passage and then to translate a list of vocabulary items considered difficult by the researcher and a professor of Spanish. Those items which at least one third of the students were not able to successfully translate were selected for glossing.

The text used in the present study was calculated to be at a seventh grade readability level, according to the Spanish readability formula of Gilliam, Pena, and Mountain (1980). A glossed version of the passage was constructed in which 53 vocabulary items were glossed in English, a greater than normal percentage compared to other glossing studies. The choice of which items to gloss was determined by the results of the field study and by the intuitions of a professor who teaches the course and the researcher about item difficulty and saliency. Each glossed item was boldfaced in the text.

Thus, both intratextual enhancement (i.e., boldfacing) and extratextual enhancement (i.e., glossing) were used.

Operational Definitions of the Variables Assessed

Psychological type was measured by means of the MBTI, which had been administered to all students in Spanish 101 one year earlier. Because some of the participants in the current study were not enrolled in that course, MBTI data were available for only 51 of the 116 subjects. Ely's (1989) 12-item scale was administered to measure tolerance of ambiguity in the context of the students' use of Spanish.

The final course grade for Spanish 201 was used to determine the proficiency level of participants in the study. The criterion of their course grade was chosen in order to avoid imposing on the instructors and students for the additional class time that would have been required to administer a standardized reading proficiency exam.

How useful participants believed the glosses to be was determined by means of a single 6-point questionnaire item. The frequency with which they referred to glosses as a comprehension aid was measured in the same manner. The amount of time participants spent reading the passage was determined by having participants raise their hands when they were ready to write their recalls. At this time, the researcher collected the copy of the text they had been reading and recorded the elapsed reading time of each participant.

Data Collection

Half of the participants read the unglossed version and the other half read the glossed version. Within classes, participants were randomly assigned to conditions. Participants were requested to read the text, write the recall of what they had read, and complete Ely's (1989) Tolerance of Ambiguity scale and the 2-item questionnaire designed to assess their attitudes toward the glosses. Participants who read the unglossed version of the text responded to these latter items hypothetically in terms of their past experience with glossed texts.

Data Analysis

Data were coded by two raters for the number of ideas correctly recalled. To secure more complete data on this variable, two scores were obtained from analysis of the recall protocols. For the first score, idea units 1 (IU1), the sole criterion used was t-units. Richards, Platt, and Weber (1985) define a t-unit as:

> A measure of the linguistic complexity of sentences, defined as the shortest unit which a sentence can be reduced to, and consisting of one independent clause together with whatever dependent clauses are attached to it (pp. 299-300).

Thirty-six t-units were identified. Coding was done by the researcher and a doctoral student in the College of Education at the University of Hawai'i at Manoa who also does research on second language education.

A second score, idea units 2 (IU2), which used a smaller unit of analysis, was obtained using the following rules: (a) count all nouns, (b) count all verbs, except copulative verbs, (c) if a copulative verb is not followed by a noun, count the adverb or adjective which follows the verb, (d) count negatives, such as *not* and *never*, and (e) count appositives and proper names as one unit. Richards, Platt, and Weber (1985) define a copulative verb as one that, "links a subject to a complement" (p. 65). One hundred eighty-seven units were identified applying these criteria. For each aspect of the data analysis, interrater agreement and the kappa coefficient (Cohen, 1960, cited in Chaudron, Crookes, & Long, 1988), a measure which takes into account the probability of chance agreements, were 97% or higher.

The average scores for IU1 and IU2 of students who read the glossed text were compared with those of students who read the unglossed text with simple t-tests. Subsequently, regression models were generated to test for interaction effects between glossing and each of the other variables under study using the Proc GLM program of the SAS statistical package, version 5.18. Parallel sets of analyses were completed based on each of the two measures of the dependent variable, IU1 and IU2. The potentially interactive variables were: proficiency (Prof), course grade in Spanish 201;

tolerance of ambiguity (TOA), total score on the 12-item Ely scale; each of the four dimensions of psychological type (MBTI - EI, SN, TF, and JP scale scores); time spent reading the text (Time); an index of the frequency of gloss use, real and hypothetical (Often); and, an index of how useful glosses were felt to be, real and hypothetical (Useful).

Table 1:   Descriptive Statistics of All Variables for All Participants

Variable	N	Mean	Standard Deviation
IU1	116	15.95	5.96
IU2	116	57.16	23.29
Treat	116	0.50	0.50
Time	116	13.77	3.89
Often	116	5.25	0.98
Useful	116	5.47	0.92
TOA	116	33.56	6.99
Prof	115	3.30	0.75
EI	51	102.80	25.48
SN	51	99.94	23.30
TF	51	101.35	20.83
JP	51	96.96	22.97

Note: IU1 = The first recall measure; IU2 = the second recall measure; Treat = whether or not the glossed version of the text was read; Time = time spent reading the text; Often = how often glosses were used; Useful = how useful glosses were perceived to be; TOA = tolerance of ambiguity; Prof = Spanish proficiency; EI = extravert/introvert dimension on MBTI; SN = sensing/intuition dimension on MBTI; TF = thinking/feeling dimension on MBTI; JP = judging/perceiving dimension on MBTI.

RESULTS AND DISCUSSION

The means and standard deviations for each of the variables in the study are shown in Tables 1 through 3. These data are provided for the participants overall, as well as for members of the glossed and unglossed conditions separately.

Table 2: Descriptive Statistics of All Variables for Control Group

Variable	N	Mean	Standard Deviation
IU1	58	13.74	5.44
IU2	58	48.33	19.17
Treat	58	-	-
Time	58	14.31	4.01
Often	58	5.31	0.98
Useful	58	5.50	0.94
TOA	58	34.00	6.82
Prof	58	3.33	0.78
EI	23	102.48	23.05
SN	23	96.57	23.92
TF	23	104.13	19.57
JP	23	92.83	19.22

Table 3:   Descriptive Statistics of All Variables for Experimental Group

Variable	N	Mean	Standard Deviation
IU1	58	18.16	5.68
IU2	58	66.00	23.84
Treat	58	-	-
Time	58	13.23	3.73
Often	58	5.19	0.98
Useful	58	5.43	0.90
TOA	58	33.13	7.20
Prof	57	3.28	0.73
EI	28	103.07	27.31
SN	28	102.71	22.83
TF	28	99.07	21.91
JP	28	100.36	25.49

The first research question asked if there was a significant difference between the amount of the text recalled by members of the two treatment groups. A t-test of the means on both measures of recall showed a significant effect for glossing. T-tests yielded the following results: IU1, $t(114) = 4.37$, $p<.05$; IU2, $t(114) = 4.40$, $p<.05$. As the mean recall scores indicate, students who read the glossed text recalled approximately 30% more idea units.

The second research question asked if any of the other independent variables interacted with glossing to significantly affect recall. No interactions were found at a significance level of .05 between any one of these variables and glossing. However, the interaction between glossing and time spent reading approached significance at the .07 level for IU2.

Given that glossing substantially increased recall in this study, a key question arises as to how to explain those studies in which glossing did not seem to enhance comprehension. Perhaps, the

answer lies in viewing glossing as only one factor which can affect comprehension. This view relates to the more general point that in the sphere of human cognition and behavior, no single variable alone can be guaranteed to produce a particular effect. Instead, the effect of any one factor depends on the context provided by other relevant variables. In the specific case of glossing, as stated previously, the difficulty of the text, the readers' proficiency, the number and choice of items glossed, and many other factors determine whether glossing will actually improve comprehension in a particular situation. One reason why glossing appeared effective in this study may have been that a much higher than average percentage of vocabulary items was glossed. Perhaps other researchers underestimated the amount of help students needed. Only Johnson (1982) used a similar percentage of glossed items. Also, with the exception of the present investigation and those of Jacobs, Dufon, and Fong (1994) and Johnson (1982), none of the other glossing studies reported using empirical procedures to determine which words to gloss.

This idea of the proper use of glosses is consistent with Eskey's (1988) concept of the need to "hold in the bottom" of the reading process. Eskey supports an interactive view of reading and cautions against too much faith in exclusively top-down routes to comprehension. He believes that vocabulary knowledge provides an essential base for top-down processing to occur. Thus, information from the printed page (the bottom) interacts with readers' previous knowledge and reading strategies (the top) to enable readers to derive their own meanings from texts.

To fit efficient use of glossing into the context of learner strategies, one can assume that readers must first be aware of a comprehension breakdown. Second, they must be proficient in fix-up strategies and should know in which order to use them. The point here is that the use of glosses should not be the readers' first choice when faced with a comprehension breakdown, because this would deny students practice in strategies they will need to use with unglossed texts. Third, if rereading, looking ahead, guessing from context, paraphrasing, and other strategies fail, and readers turn to outside resources, such as glosses, they should be aware of how to use these resources without losing sight of the overall meaning of the text.

   The second major finding from the present study is the absence of any significant interaction between glossing and any of the other selected variables. Of course, such a finding does not indicate that these other variables do not affect recall; that was not tested in this study and the obtained correlations suggest otherwise. The interaction between glossing and time spent reading approached significance for one of the two measures of recall. Perhaps this finding may be explained by surmising that participants who read the glossed version of the text found that the added time spent reading was worthwhile, because the glosses provided them with the information necessary to make additional time on task a fruitful activity. On the other hand, those who read the unglossed version may not have been able to make as good use of time spent reading and rereading. How students actually process glossed texts is an important topic for future investigations.

   Although the interactions between glossing and the four MBTI dimensions were not significant, the correlations (see Table 4) between recall and introversion, intuition, and thinking suggest that psychological type is an important variable to consider in future studies of reading comprehension.

   Although tolerance of ambiguity did not interact with glossing to affect recall, the correlations between tolerance of ambiguity and the scales measuring how useful students found glosses to be and how often they used them were significant and in the expected direction. This finding provides some evidence for the concurrent validity of these three measures.

   Can the significant main effect for glossing found in this study be taken to support the belief that the practice of glossing is a pedagogically sound one? The answer to this question depends, in part, on the answer to another question: Should L2 students be asked to read texts which are far above their proficiency level? If the answer is yes, then some means must be found to make up for the great gap that will often exist between the difficulty level of the passage and learners' proficiency. At the same time, there are many means besides glossing of dealing with the vocabulary component of this gap, such as preteaching relevant vocabulary, training students in guessing from context, and using elaboration within the text (Larsen-Freeman & Long, 1991). When elaboration is used,

Table 4: **Degrees of Freedom, F Values, and Probabilities for the Interactions with the Two Dependent Variables**

Variables	Degrees of Freedom	F Values	p
Time - IU1	(1, 113)	1.48	0.23
Time - IU2	(1, 113)	3.34	0.07
Often - IU1	(1, 113)	0.14	0.71
Often - IU2	(1, 113)	0.66	0.42
Useful - IU1	(1, 113)	0.97	0.33
Useful - IU2	(1, 113)	0.87	0.35
TOA - IU1	(1, 113)	0.59	0.44
TOA - IU2	(1, 113)	0.02	0.88
Prof - IU1	(1, 112)	1.66	0.20
Prof - IU2	(1, 112)	1.27	0.26
EI - IU1	(1,47)	0.45	0.51
EI - IU2	(1,47)	1.32	0.26
SN - IU1	(1,47)	2.23	0.14
SN - IU2	(1,47)	1.93	0.17
TF - IU1	(1,47)	0.30	0.59
TF - IU2	(1,47)	1.37	0.25
JP - IU1	(1,47)	0.45	0.51
JP- IU2	(1,47)	1.01	0.32

nothing is deleted from the text. Instead, text paraphrasing and other means are used to help readers with difficult vocabulary and syntax.

Other approaches for helping students with difficult vocabulary include encouraging them to use outside resources, such as the teacher, classmates, or dictionaries, and focusing on one content area. With this latter strategy, students build up a base of vocabulary knowledge in that specific area, which is one rationale

for content-based instruction (Brinton, Snow, & Wesche, 1989). Parry (1993), in a case study of one student studying anthropology in a second language, found that the student was able to guess from context with a much greater degree of general correctness than had been found in previous studies. Parry hypothesizes that this relative success was due to the fact that the student was reading in a rich context. In other words, she was an anthropology student attending lectures and reading books and articles in her own field of specialization. Thus, she had much more context to draw on than is usually the case in most studies, or in most L2 classrooms, where students tend to read fairly short, unrelated passages.

Certainly, glossing can be used in tandem with any and all of the other options, as well as alone. To paraphrase Nation's (1990) list of the reasons for choosing glossing: (1) glosses are quick to find and easy to use, (2) they can be used by people reading without assistance, and (3) individual readers only need to refer to the glosses of the words which they do not know.

Computers can be an effective tool for both glossing use and research on glossing (e.g., Blohm, 1987). In computer assisted instruction, students who encounter unknown vocabulary items could access a gloss and a list could be kept of the glosses which students accessed (Bland, Noblitt, Armington, & Gay, 1990). Such a list would provide educators and students with valuable information; for example, it might provide clues about students' reading strategies.

Researchers may also wish to examine the many possible ways that glossing could be integrated into cooperative and collaborative learning methodologies (Johnson, Johnson, & Holubec, 1993). For example, two versions of a glossed text could be created, each having only half of the glosses. These two versions would be given to different members of student pairs. Thus, readers would have to ask their partners if they needed to know the meaning of a specific glossed item. This procedure could be incorporated in dyadic reading scripts (e.g., Hythecker, Dansereau, & Rocklin, 1988).

CONCLUSION

In this study, glossing was associated with increased text recall by L2 readers. Two possible explanations for the effect of glossing on text recall are the relative number of glosses and the fact that empirical means were used to ascertain which vocabulary items students did not know. Especially in cases where authentic texts are used, L2 learners often need the assistance that vocabulary glosses provide. Students' use of glosses can be facilitated by providing specialized training in reading strategies. At the same time, additional means, as mentioned above, also help readers cope with difficult lexis. Educators will need to consider whether these strategies might not actually be more effective than vocabulary glossing for the enhancement of reading proficiency and language acquisition.

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George M. Jacobs is a language specialist at the Southeast Asian Ministers of Education Organization Regional Language Centre (SEAMEO RELC) in Singapore. His interests include reading and writing instruction, cooperative learning, and the integration of environmental education in second language instruction.

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Reviewed by
Patrick Gonzales
University of California, Los Angeles

Talk at Work is, as its length indicates, a voluminous collection of papers that investigate the intricacies of talk and interaction within a variety of work settings, or "institutional" contexts. The articles included in this book base their analyses on the research tradition of conversation analysis (CA), a line of inquiry begun well over two decades ago by Harvey Sacks and his colleagues Emanuel Schegloff and Gail Jefferson.[1] Written primarily by scholars within sociology, a field with a tradition of interest in such settings as the criminal justice system and psychiatric and medical encounters, this collection of research focusing on the talk-in-interaction between "professionals and lay persons" (p. 3) is the first and most ambitious collection of work entirely dedicated to the examination of institutional interactions from a CA perspective. The collection also represents a welcome trend in studies of language and social interaction, and in particular in CA studies, in which a group of thematically-related papers is presented together rather than scattered throughout various journals and books across several fields. In addition, the publication of this volume within the Cambridge series, Studies in Interactional Sociolinguistics, which includes such well-known works as *Discourse Strategies* (Gumperz, 1982), *Politeness* (Brown & Levinson, 1987), *Discourse Markers* (Schiffrin, 1987), and *Talking Voices* (Tannen, 1989), among others, moves the important work done within CA more directly into the arena of mainstream sociolinguistic inquiry, thus making research which might otherwise go unnoticed elsewhere more visible.

Though the volume contains articles concerned with "institutional interactions," the authors do not assume that the discursive devices taken up for analysis are wholly unique to the

settings from which the data are drawn. Nor do they assume that the settings alone are all that is needed to understand the kinds of talk which go on in them. Indeed, as Drew and Heritage state in the introductory chapter of the book:

> Just as people in a workplace may talk together about matters unconnected with their work, so too places not usually considered 'institutional,' for example a private home, may become the settings for work-related interactions. Thus the institutionality of an interaction is not determined by its setting. Rather, interaction is institutional insofar as participants' institutional or professional identities are somehow made relevant to the work activities in which they are engaged. (pp. 3-4)

Each of the papers included in this book examines some aspect of talk and interaction in a particular institutional context, ranging from news interviews and court proceedings to doctor-patient interactions and job interviews. In particular, the studies as a group investigate the work accomplished through question-answer sequences. As in many work-related settings which provide some service to a general public, the interactions between professionals and lay-persons are often conducted through and integrally built upon the gathering and exchange of information. The studies contained within this volume explore how the institutional identities of questioners and answerers are constituted through interaction, how the tasks and goals of particular institutions are carried out through discourse, how the recipients of these services manage their own discourse, and how both the representatives of institutional organizations and their clients manage together the ongoing, moment-by-moment contingencies of talk and interaction.

The book contains 15 chapters, divided into four sections: Theoretical Orientations, The Activities of Questioners, The Activities of Answerers, and The Interplay between Questioning and Answering. The first section, "Theoretical Orientations," consists of three chapters addressing theoretical and methodological issues related to the analysis of human interaction. Drew and Heritage's introduction (Chapter 1) to the book is an overview of the historical and methodological origins of CA and its study of institutional settings, situating this language- and

interaction-centered approach to the study of language use within a broader view of other contemporary (and sometimes competing) theoretical and methodological approaches in the fields of anthropology, linguistics, and sociology.   Though Drew and Heritage suggest to readers who may already be informed about CA in general to proceed directly to the outline of the contents of the book (p. 5), it would be a shame for even the most informed of researchers to skip the remaining 48 pages of this well-crafted summary, for even those who think they know CA well will find the scope of the discussion integrative and insightful. Those who have not had much exposure to the CA tradition will find this introductory chapter essential for providing the background information necessary to make the readings which follow intelligible.

The second chapter in the theoretical section is "Activity Types and Language," a reprint of Levinson (1979). Levinson's essay addresses the issues involved in investigating what participants in any interaction must bring to bear in order to understand and produce question-answer sequences of various types. He proposes the concept of "activity types," which he bases on Wittgenstein's (1958a, 1958b) notion of "language games." Levinson argues that the types of activities that participants engage in are central to an understanding of language use because they delimit what is recognized as an acceptable contribution to the ongoing talk and, in part, determine what inferences can be understood from such talk.

The last chapter in the section on theoretical considerations is a contribution by Schegloff entitled "On Talk and Its Institutional Occasions." This revised version of an earlier paper (Schegloff, 1991) takes up the issue of the adequacy and relevancy of categorical terms used in the analysis of social interaction (a theme echoed by Drew & Heritage in the introduction and similarly engaged in Schegloff, 1987, 1991, and elsewhere). Schegloff focuses on two problems in the study of talk-in-interaction: the problem of "relevance" and the problem of "procedural consequentiality."   As a case in point, Schegloff analyzes segments from the now famous Bush-Rather debate, and shows how what might be initially termed an "interview" quickly devolves into something other than an interview. He argues that a term such as "interview" may thus be inadequate to describe a

particular unfolding activity. This is an important argument, for, as Schegloff suggests, it is precisely in those moments when the analyst recognizes the failure of traditional, standard terminology to adequately describe and account for social structure that advances are made in our understanding of the intricacies of human conduct, and that "[i]nvoking social structure or the setting of the talk at the outset can systematically distract from, even blind us to, details of those domains of events in the world" (p. 127).

The second section of this edited volume, "The Activities of Questioners," consists of 4 articles which examine the design of questions by professional questioners and the ways in which these questioners deal with answers to their prior questions. Bergmann's contribution ("Veiled Morality: Notes on Discretion in Psychiatry"--Chapter 4) and Clayman's essay ("Footing in the Achievement of Neutrality: The Case of News-interview Discourse"--Chapter 5) both deal with the ways in which questions are designed to achieve and maintain particular stances in the course of their professional work.   Bergmann's analysis of psychiatric intake interviews demonstrates how psychiatrists display caution, or "discretion," when they question patients about their state of mind. In a similar vein, Clayman shows how news interviewers cautiously engage in confrontational questioning yet maintain a neutral stance by avoiding the presentation of their own position.

The next two contributions, by Atkinson ("Displaying Neutrality: Formal Aspects of Informal Court Proceedings"-- Chapter 6) and Button ("Answers as Interactional Products: Two Sequential Practices Used in Job Interviews"--Chapter 7), examine how questioners deal with answers to their prior questions. Atkinson's study of arbitration proceedings in Small Claims Court shows how arbitrators avoid displaying their own assessment of witnesses' responses, and argues that this practice solves the arbitrator's central problem: that, unlike regular counsel who is expected to take a particular side in the proceedings, an arbitrator must maintain an air of neutrality during the questioning of the opposing parties, lest s/he be accused of bias in the final judgment. Button's study of an unsuccessful interview for the position of head of the arts faculty at a school in England, reprinted here as a revised version of an earlier paper (Button, 1987), examines how the interviewers came to conclude that the rejected candidate was

unable to understand what was being asked in the interview. From an analysis of the videotaped interview, Button concludes that the interviewers' withholding of affiliative responses combined with a similar lack of clarification of their own questions helps constitute the interviewee's answers as his final word, and, subsequently, as the "objective" basis for later passing judgment on the interviewee.

The third section, "The Activities of Answerers," contains three papers addressing the role of the answerer in the question-answer sequence. Chapter 8, entitled "The Delivery and Reception of Diagnosis in the General-Practice Consultation," by Heath, analyzes doctor-patient interactions in England and shows how patients refrain from responding to doctors' delivery of the diagnosis, even when the doctor invites the patients to reply. Heath argues that this systematic reluctance to respond to the doctor may explain why national health service clients are believed to be poorly informed and less likely to become active in seeking alternative treatments for their ailments. The ninth chapter, by Greatbatch, entitled "On the Management of Disagreement between News Interviewees," examines how conflicts can escalate between participants of news interview panels (involving two or more persons with opposing points of view). He shows how the interviewees' placement of turns at talk differ markedly from the ways in which disagreement is managed in ordinary conversation. Chapter 10, "Interviewing in Intercultural Situations," by Gumperz, reports on job-training interviews in England involving native and nonnative speakers of English. The study shows how native-speaker interviewers and nonnative-speaker interviewees rely on different systems of "contextualization conventions," and thus often find themselves misunderstanding and misinterpreting one another's talk. Gumperz argues that since the nonnative speakers are at a disadvantage in such institutionalized encounters, there exists the potential for more serious effects on their status and success in the larger society.

The last section, "The Interplay between Questioning and Answering," consists of five articles which investigate how questioners and answerers accomplish particular interactional goals through question-answer sequences. Maynard's examination (Chapter 11) of the delivery of bad news shows how clinicians delay the delivery of a diagnosis until after a series of turns, which he calls a "perspective-display series," through which the

recipient's own view of the situation is elicited. The clinicians then shape their delivery of a "bad news" diagnosis as a confirmation or co-implication of the recipient's perspective, thus potentially avoiding negative or confrontational situations.

Chapter 12, "Dilemmas of advice: aspects of the delivery and reception of advice in interactions between Health Visitors and first-time mothers," by Heritage & Sefi, examines the ways in which home Health Visitors in England manage the delivery of advice to first-time mothers who may or may not be receptive to such advice but who are, nonetheless, required by public policy to subject themselves to it. They analyze in detail how such advice is initiated during these home visits and how it is received (or not received) by the parents. The authors point out that the delivery of advice, perhaps especially in this context, assumes that the recipient(s) lack a particular kind of competence, though such an assumption may prove interactionally problematic.

In "The Interactional Organization of Calls for Emergency Assistance" (Chapter 13), Zimmerman shows how both the particular institutional requirements of emergency service organizations as well as the uniqueness of each emergency telephone call influences the ways in which the call-taker and callers manage their interactions. His analysis demonstrates that despite the differential needs of callers and call-takers, they locally manage their conversations so as to achieve their respective goals. Drew's chapter, entitled "Contested Evidence in Courtroom Cross-Examination: The Case of a Trial for Rape" (Chapter 14), looks at how both witnesses and lawyers attempt to undermine and discredit one another through particular non-cooperative and non-collaborative interactional moves. Drew shows that a witness may undermine and challenge a particular line of questioning by refusing to confirm particular incidents and by offering alternative descriptions. Likewise, a lawyer may attempt to discredit a witness by pointing out contrasts in a witness's testimony, thereby creating a "puzzle" which subtly suggests a credibility problem.

The final chapter, by Jefferson and Lee, "The Rejection of Advice: Managing the Problematic Convergence of a 'Troubles-Telling' and a 'Service Encounter'" (a reprint of their 1981 paper), shows how when the delivery of troubles-telling results in the offering of advice by the recipient of the telling, this advice is subsequently often rejected or resisted by the troubles-teller. By

way of contrast, they compare this outcome with troubles telling in service encounters, where the troubles teller may specifically be seeking advice.   They conclude that, unlike in ordinary conversation, the receipt of advice in service encounters is treated by participants as nonproblematic and is often accepted.

Talk at Work is a must read for applied linguists interested in the organization of discourse, but it is equally informative for those primarily interested in the elucidation of linguistic structure or the communicative practices of particular professions.   The chapters by Drew & Heritage and Schegloff are especially significant contributions to fundamental questions in the growing field of discourse studies.   In addition, Gumperz's article is of particular interest to those studying second language learning, interlanguage, and acculturation, areas which have not generally been a focus of CA inquiry.

That being said, there are a few minor problems with this collection.   First, it is not clear who the intended audience is for the book.   Given its publication in the Cambridge series on Interactional Sociolinguistics, and the inclusion of several authors who do not strictly do CA-type work, the editors appear to be aiming at an audience wider than those interested solely in CA or in the discourse of particular professions.   However, such a wider audience would include many without any background in CA.   Thus, it would have been helpful if the editors included an appendix containing the transcription system necessary to read the many transcripts contained in this book.   Only Gumperz includes a key to his transcription system in an appendix at the end of his chapter.   But beyond the issue of the transcription conventions, the collection would appear to be quite challenging for a reader with no grounding in earlier CA research.   This book, therefore, should not be any reader's first introduction to CA studies.

A second problem concerns the inclusion of Levinson's (1979) paper in this collection.   In their introduction, Drew and Heritage detail the CA conception of context, which treats utterances and their actions as context shaped *and* context renewing (p. 18), thereby recognizing the moment-by-moment development of context within interaction.   Levinson's essay argues for the importance of activities (as constitutive of context) as shaping utterances and actions;   however, what the essay crucially fails to recognize is the context renewing capability of

utterances and actions as well, thus putting forth a particular theory of "context" which Drew and Heritage argue CA has successfully avoided (p. 19). This reader is thus perplexed at the inclusion of Levinson's (1979) paper in the section on "theoretical orientations" for it seems to provide and detail a somewhat different view of the role and constitution of "context" than that held by the editors of this book and by the research tradition of CA.

One final problem resulting from any selection process is the limited set of work settings studied in this volume: news interviews, health-related encounters, job interviews, court proceedings, calls to emergency services, and service encounters. In contrast, interactions between professionals and lay persons include a seemingly infinite number of other "work settings" in which the asymmetrical relationships existing between the professional and the lay person are more or less pronounced. In addition, while the editors of this volume have chosen to focus on interactions between lay persons and professionals, the 'doing of work' and the discourse practices which help constitute such activity are not limited to such identities. That is, institutional varieties of social interaction and language use also take place between professional colleagues (e.g., medical case consultations between physicians) whose asymmetries of knowledge and experience may be less of an issue (Cicourel, 1989).

All in all, *Talk at Work* is a welcome addition to a growing number of books which examine language and social interaction in various settings. For students of discourse research working in traditions other than CA, this collection serves as an excellent example of the power and richness that conversation analysis can provide in the detailed examination of talk and interaction. For CA researchers, this volume will provide an excellent resource for the continued inquiry into the defining characteristics of institutional interaction, in addition to the everyday conversations through which people live their lives.

NOTE

[1] For detailed discussions of the methodological and theoretical roots of CA and its historical development see Atkinson & Heritage (1984), Heritage (1984), Goodwin & Heritage (1990), and Schegloff (1992).

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Patrick Gonzales is a doctoral candidate in applied linguistics at UCLA. His interests include the study of talk and interaction in scientific laboratories and mathematics classrooms, and the relationship between grammar and interaction.

An Introduction to Language (**Fifth Edition**) by Victoria Fromkin and Robert Rodman. Fort Worth: Harcourt Brace Jovanovich, 1993. xvi + 544 pp.

Reviewed by
Rachel Lagunoff
University of California, Los Angeles

> There have been considerable problems of communication between theoretical linguistics and other disciplines concerned with the study of natural language, and it seems that many psychologists, students of artificial intelligence, applied linguists, and literary critics have abandoned the idea that they could learn very much from the results reached in theoretical linguistics—so much the worse for theoretical linguistics and so much the worse for the interdisciplinary study of natural language.
>
> <div align="right">Peter Bosch
Agreement and Anaphora</div>

In an interdisciplinary field such as applied linguistics, it is important for students to have a good grounding in whichever base disciplines they choose to work within. Although there is debate as to how important theoretical linguistics is to applied linguistics (see for example, *IAL*, 1990), no one can deny that the study of *language* is central to applied linguists' concerns. Once it is agreed that the study of a particular subject is important, the next problem is how to present it to students new to the field in a way that is interesting as well as informative. Large numbers of people in our society seem to have a fear of "grammar," no doubt bred in primary and secondary school classrooms--a fear which follows them well into college. Thus an introductory linguistics textbook must be user-friendly in order to be effective. *An Introduction to Language* is such a textbook, the new (fifth) edition being friendlier than ever.

The book is specifically designed to serve as a general introduction to the field, providing a broad enough view to be useful to students in various disciplines. It is explicitly *not* designed to be an overview of the current state of linguistics; researchers in other fields wishing to gain a basic understanding of what language is and how it works could start by reading this book, but would require further reading and training to be able to apply any aspect of language study to their field (or vice versa).

An Introduction to Language is divided into five parts: The Nature of Human Language, Grammatical Aspects of Language, Social Aspects of Language, Biological Aspects of Language, and Language in the Computer Age. Part One consists of one chapter, What is Language?, which provides answers to basic questions about what human language is and how it differs from nonhuman communication. Part Two comprises the next five chapters of the book, on morphology, syntax, semantics (including sections on discourse and pragmatics), phonetics, and phonology (in that (new) order). Part Three has chapters on sociolinguistics, historical linguistics, and writing systems. Part Four now only includes chapters on acquisition and human language processing, with computer processing separated into a full chapter in the new Part Five.

Each part, chapter and section, and many a subsection, begins with a quote or two, making the content seem relevant to everyday concerns, or highlighting an upcoming linguistic concept. The people quoted range from St. Augustine to Walt Whitman, from Noam Chomsky to Edward Sapir (although strangely the Sapir-Whorf hypothesis, a well-known concept that might be appealing to linguistics novices or students of linguistic anthropology, is never mentioned[1]). Each chapter ends with a summary, followed by references for further reading and exercises; the appendix contains a glossary and index. For convenient reference, phonetic charts are reproduced inside the covers: A phonetic alphabet for English pronunciation, the articulatory classification of American English nonvowel sounds, and a labeled drawing of the human articulatory system. The previous edition also included a phonetic feature chart; its omission from front-cover position is consistent with the new edition's revision: The phonetic feature chart is omitted from the phonetics chapter, and a phonemic feature chart is added in the phonology chapter.

Other revisions in content include the addition of linguistic examples, and the incorporation of recent research in various areas. For example, the section Styles, Slang, and Jargon in Chapter 7 includes a reference to Munro's (1989) book on college slang; the section The Autonomy of Language in Chapter 11 reports on recent studies of linguistically competent people who are otherwise severely intellectually handicapped; the section Can Chimps Learn Human Language? in Chapter 10 summarizes the latest study involving a chimpanzee's ability to manipulate symbols. In order to make the new edition more up-to-date and less theoretically specialized, some information has been deleted, such as the references to "move alpha" in the syntax chapter, and to meaning postulates in the semantics chapter. Those familiar with the fourth edition will also find changes in some of the end-of-chapter exercises.

Two aspects which have made earlier editions of this book so approachable and entertaining, the design and the cartoons, have also been revised. Many of the chapter sections of the new edition have been further subdivided with new headings, making it easy to flip through the table of contents or the chapters to find particular topics. As in the previous edition, all key words and concepts are boldfaced, both in the chapter and in the chapter summaries; this presumably helps students locate and remember important terms. New cartoons have been added, such as the *New Yorker*'s "Further Studies in Pigeon English." (Of course, some of the good old ones had to be taken out to make room.)

One of the strengths of *Introduction* is its coverage of important linguistic research in areas which have traditionally been neglected. An example is the section Language and Sexism which spans topics from the derivation of the word *hussy* to the higher pitch of women's voices. The subsection, The Generic "He", includes an added example of an 18th century use of *they* with the singular antecedent a *person*, and an elaboration of the history of the false generic *he*. Admirably, the authors have weeded out possible instances of linguistic sexism on their own part: A sentence in the fourth edition which began "if you hear a man clearing his throat" (p. 32) has been changed to "if you heard someone clearing their throat" (p. 177), with a footnote explaining the use of the third person plural as a gender neutral singular.

Another such area is sign language. In Chapter 1, the authors make a point of mentioning that sign languages maintain the same arbitrary relationship between form and meaning as do spoken languages. A whole section is devoted to describing American Sign Language (ASL) history, structure, and acquisition. (This inclusion of a highly studied language would not be so extraordinary were it not for the appalling fact that other introductory textbooks[2] only mention ASL with respect to its (purported) use in experiments teaching language to primates.[3]) Nevertheless, the authors still marginalize sign languages rather than treating them on a par with spoken languages. The ASL section is inserted in the chapter on language acquisition, mostly, it appears, to make a point about the biological nature of human language. Future editions could further legitimize sign languages by incorporating examples from different sign languages of the world into the content of the chapters. Seeing in practice that specific aspects of sign language grammars (including phonology!) can be compared to those of spoken languages would help students new to language study understand what makes sign "real" language.

A third noteworthy inclusion is the detailed section on Black English (BE), including short descriptions of some aspects of its phonology, syntax and history. However, this section could have done with more revision. First, BE is defined as being "spoken by a large section of non-middle-class African-Americans" (p. 287). While early studies of BE did focus on urban working class speakers, more recent research has turned up certain features which are common to middle class blacks as well (Marcyliena Morgan, personal communication). Examples are the glottal coarticulation accompanying devoicing of stressed final voiced stops (Fasold, 1981), and the "semi-auxiliary" *come*, where *come* is used aspectually to express indignation rather than as a main verb (Spears, 1982). The complexities of defining a socio-cultural (as opposed to regional) dialect are especially evident in research on BE: Among relevant factors are age-grading, sex-grading, status-grading, and peer-group influence (Dillard, 1972). In order for students to better grasp what is at issue in defining dialects such as BE and Chicano English (to which a section is also devoted), it would be worth the space to include further discussion of sociolinguistic variables.

While the new edition looks slick and well put together in general, an apparent lack of thorough proofreading has resulted in numerous spelling errors, word substitutions, and style inconsistencies; some examples follow.   There are at least two instances of a linguist's name being misspelled in one place in the book, though correctly in another. In the table given in the front of the book and in Chapter 5, A Phonetic Alphabet for English Pronunciation, *bait* (instead of *bite*) is given as an example word for the sound [aj]. The acronym for my and Fromkin's university is given as "UCLA" in one chapter, but "U.C.L.A." in another. While the errors range from the serious to the trivial, all suggest some carelessness, probably on the part of the editors. There is one positive side-effect of the mistakes, however: They allow observant students to delight in catching them.

The fact that I have chosen to critique such particular aspects of the textbook is evidence of its general thoroughness and clarity. Fromkin and Rodman are obviously dedicated to presenting the subject of linguistics in a format which is not only comprehensive and informative, but relevant and entertaining. Beginning students of linguistics, however they eventually choose to apply their new knowledge, will continue to be well-served by this introduction to the field.

NOTES

[1] For an example of how the hypothesis could be discussed at an introductory level, see Finegan & Besnier (1989, p. 22).

[2] Those I am familiar with are: O'Grady, Dobrovolsky & Aronoff (1989) (reviewed by Stephen Adewole, in *IAL*, vol. 1, no. 1, June 1990), and Finegan & Besnier (1989). Akmajian et al. (1990) give a good description of ASL in their glossary, but in the text only mention ASL apart from ape studies in a parenthetical note on "slips of the hand."

[3] In a critique of some of these experiments, Seidenberg & Petitto (1979) point out that the apes were not exposed to fluent, inflected ASL as used by deaf people, but a simplified use of individual ASL signs. Wallman (1992), in a general critical evaluation of ape/language studies, also discusses the use and interpretation of sign by researchers. The claim that the primates were even exposed to ASL (no less used it) is doubtful at best.

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Rachel Lagunoff is a doctoral student in applied linguistics at UCLA. Her interests include the study of impersonal third-person plural pronouns, and the teaching of introductory linguistics. She has experience teaching French, English as a second language, and linguistics.

Language Transfer in Language Learning edited by Susan M. Gass and Larry Selinker. Amsterdam and Philadelphia: John Benjamins Publishing Company, 1993. 236 pp.

Reviewed by
Howard Williams
University of California, Los Angeles

LTLL is a collection of twelve papers, eight of which are either direct reprints or slight revisions of articles that appeared in Gass and Selinker (1983). A few are theoretical in nature: most of the rest investigate cases where native language forms appear as features of interlanguages (IL). After a good updated overview introduction by the editors, the book opens with the late S. Pit Corder's "Role for the Mother Tongue," which reasons against the idea that L1s inhibit learning in any sense, though they may facilitate rates of learning where typologies are similar, at least at later stages. The author tries to draw logical conclusions of the paradigm shift away from behaviorism approaches, a shift by now a generation old in SLA. He distinguishes phonology, where L1 features do play a salient role, from syntax, where they seem not to do so. While borrowing of mother tongue features is an attested suppletion strategy, it is not, in his view, a learning strategy: interference as such is an obsolete notion.

The other papers, old and new, do nothing to seriously undermine Corder's picture of transfer. Among the reprints is J. Schachter's "New Account of Language Transfer," which presents a hypothesis-testing model in which all internalized constructs, both L1 and L2, constrain the inferencing process; this constraint is not to be understood as the 'blocking effect' of interference, however. Ard and Homburg's paper sets up a means of predicting lexical transfer based on similarity of lexemes. Broselow's article investigates epenthesis in the English of native speakers of two Arabic dialects, by showing dialect-specific transfer of vowel insertion processes. The updates include "Language Transfer and the Acquisition of Pronouns" by Gundel and Tarone, who have added to their data set and included some new discussion; Bartelt's "Rhetorical Transfer in Apachean English"; and Scarcella's

"Interethnic Conversation and Second Language Acquisition: Discourse Accent Revisited." For a review of the original volume see Arabski (1985).

Now, for new papers: Peter Jordens investigates transfer in the interlanguage of American and Dutch speakers of German in his contribution "The Cognitive Function of Case Marking." In English and Dutch, role-prominence (agentivity) and referential prominence (topicality) tend to fall to the same NP, a subject. In German, a V2 language which case-marks most NPs, the two functions may be separated such that dative/accusative topics may occur S-initially, where topics tend to be in languages with less strict word order. J. focuses on speaker judgments on a quasi-fragmentary S-type construction found in news headlines and elsewhere in which an initial NP occurs case-marked either nominative or accusative and requires intuitions about role/referential prominence to come into play. Across languages, the selection of subjects is held to follow an 'egocentric bias' by which high agentivity together with "the more subjective factor of a speaker's actual personal involvement" (p. 141) influence subject selection. J. has dealt with such headline constructions before (1983, 1989) and has argued that NS selection of case is heavily influenced by the factor of [+implied person]. Predictably, he notes, accusative NPs tend to be animate and lack a determiner (implying new information). For transfer, the hypothesis is that the crosslinguistic tendency toward egocentric bias in subject selection will carry over for Dutch and English speakers asked to assign case in headline structures: J's results strongly suggest that it does carry over as predicted.

The paper by Selinker and Lakshamanan posits a Multiple Effects Principle (MEP) to account adequately for fossilization. MEs include, centrally, transfer of L1 forms. Indeed, such transfer is highlighted as foremost among these effects. There are three others. One is the presence or absence of markedness in relevant equivalent forms in the interlanguage; thus pro-drop, here assumed to be marked, transfers from Italian into English ILs and fossilizes there. The second is "affect". The third is a posited cognitive need for symmetry which conspires to produce *would* in *if*-clauses to match that in accompanying conditional main clauses; this need is also said to produce the false generalizing of relatively free adverb positions in English VPs absolutely free ones, thus creating *[V Adv NP], violating a condition of strict [V NP] adjacency. One

cannot predict fossilization on the basis of transfer alone, say the authors, but its likelihood increases to the extent that other such factors enter into the picture. Thus the need for symmetry produces overgeneralization of the subcategorization frames for *hope* and *wish* to ECM verbs like *want*: *I want that you help me*; the likelihood of this sentence occurring is compounded since ECM constructions are crosslinguistically marked. As given, the MEP fails yet to be very predictive partly because the precise nature of the effects is not spelled out (what counts as 'symmetrical' linguistic behavior?) and partly since we need some means for weighting the effects, both absolutely and relative to each other. As the authors note, individual idiosyncrasies also play a role.

Lydia White's "Universal Grammar: Is It Just a New Name for Old Problems?" is a cautious and evenhanded attempt to show that a study of transfer with reference to UG can provide an interpretation of certain transfer types which earlier Contrastive Analysis approaches could not. A UG approach allows for a "creative construction" path of development (Dulay and Burt, 1974) in which parameter resettings may occur within the set of possible grammars. UG can account for differential acquisition of similar string-types by means of a theory of differing D-structures; clusters of properties that fall out as a consequence of one L1 parameter may be studied as a unit in the IL. The principles-and-parameters approach plays an additional role in connection with markedness in learnability: reflexive binding options in Korean and Japanese vs. English are the examples given, where unmarked subject-only binding (either subject or object binding in English) on the basis of positive evidence, while the reverse process leads to a nontarget grammar. Though admitting that actual transfer data are often incompatible with claims about L2 availability of UG, W. states that evidence still weighs toward this availability.

There is much evidence that L2 grammars overgenerate; the question is the extent to which L1s are responsible for this overgeneration. Helmut Zobl's paper "Prior Linguistic Knowledge and the Conservatism of the Learning Procedure" is an interesting attempt at teasing out the effects of L1s from maturational and other factors in the formation of wide vs. narrow grammars by investigating differential judgments on sentence acceptability tests taken by those for whom English is an L3+ as opposed to merely an L2. It is proposed that already multilingual (ML) speakers will more

readily accept L3+ sentences which reflect more marked, or superset, grammars than will unilingual (UL) speakers learning an L2. Groups of matched MLs and ULs provided judgments on English sentences, both grammatical and not, which exhibited arguably marked syntactic constructions including strict V-O adjacency, movement from VP in IO-DO structures, null NPs, COMP-deletion, superiority, movement from ECM clauses, long-distance wh-movement, and 'picture-noun' movement. In all cases the issue was whether MLs would tend to accept more sentences reflecting a more marked, less default-set grammar. While details remain to be provided of the behavior of particular languages already learned with respect to the parameters in question, there does appear to be a general tendency for MLs to be less conservative in their judgments, hence more prone to NNL over-generalization. These overgenerating IL grammars are related to overall claims that (a) the notion VP is less well-defined in the ILs of MLs, and (b) that c-command "plays a somewhat diminished role in [ML] grammar formation" (p. 192).

  LTLL, then, offers two new data-based studies purporting to illustrate transfer, one new general theoretical paper, and one new hypothesis concerning fossilization. It is not clear why the volume includes so little new work; judging from the bibliography in Odlin's (1989) book on transfer, it may be that relatively little interesting work has been done since Gass and Selinker (1983). Whatever the reasons, the book contains some almost-classic older articles and some new ones interesting enough to provoke further investigations.

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Howard Williams is a doctoral student in the Department of TESL and Applied Linguistics at the University of California, Los Angeles.

Lexical Phrases and Language Teaching by James R. Nattinger and Jeanette S. DeCarrico. Oxford University Press, 1992. xiii + 218 pp.

Reviewed by
David Leech
University of California, Los Angeles

Studies from various traditions of natural language research into socially institutionalized, and thereby lexicalized, phraseology (i.e., lexical-grammatical collocations) have been of increasing interest to some applied linguists. Such phraseology ranges from fixed expressions (idioms) with high semantic opacity (noncompositionality) and high structural invariability to relatively variable and transparent expressions. The theoretical background to the 'lexical phrases' (LPs) referred to in the title of Nattinger & DeCarrico's recent book, *Lexical Phrases and Language Teaching,* is introduced in their very useful and fairly complete literature survey of Chapter 1. 'Lexical phrases' are held by the authors to be locatable along a "form/function" continuum (Chapter 1) of expressions, which they analyze according to the following criteria: 'canonical' *versus* 'non-canonical shape' (having one of the "typical shapes of English structures"), idiomaticity, as defined above, and pragmatic illocutionary (speech act) or cohesive discourse function.

The authors then present some classification lists,[1] their categories culled from various sources: a "functional" (speech act) list and a "[text-]organizational" (i.e., metalanguage, *cf.* Vande Kopple, 1989) list. Unfortunately, it is not made clear how these schemes might relate systematically to constitute LPs in support of the authors' implicit, unsubstantiated claim that the form and function continua are somehow parallel, inseparable, or identical. The authors then propose a catalog of LPs in Chapter 2 derived from these schemes. This catalog contains a mixture of formal and functional classifications, which, it is claimed, move from 'frozen' toward "freely compositional and productive" (p. 178) utterances: "polywords" such as *once and for all* (a "summarizer" in this case), "institutionalized expressions" such as *nice meeting you,* "phrasal

constraints" such as *for* ___ (an "exemplifier," as in *for instance*), and "sentence builders" such as l*et me start by/with X* (a "topic marker").

The authors go on to discuss, in both theoretical and practical terms, pedagogical applications according to language skill in Chapters 5 through 7 (this will be returned to later in this review). In Chapter 8 the authors address the need for further theoretical and analytic study of LPs. The scope of the research enterprise which they call for involves the coordination of the several fields that contribute to our understanding of 'lexical phrases': linguistics, discourse analysis, lexicology, language acquisition, and language teaching.

In light of the relative poverty of current knowledge and the problems and scope of the sorts of research still needed--as presented by the authors themselves (Chapters 1 & 8), it is somewhat disturbing to this reviewer that so much of the *what* and *why* sandwiched between the first and last chapters is presented with such definitiveness. The LP compendia and their proposed applications (Chapters 2 - 7) rely upon an incomplete, over-simplistic analytic framework which appears to be an *ad hoc* cross-classification of intuited, and roughly sketched collocational forms with notional judgments of their stereotypic 'speech act functions.' Yet Chapter 1, and especially Chapter 8, suggest that a complete and sufficiently delicate analytic framework is not yet extant.

My primary criticism, then, is that the reader will not find much immediately practicable direction toward these crucial levels of analysis in *Lexical Phrases*. The book nevertheless constitutes a valuable introduction and calls for further research. The authors succeed reasonably well at these goals, and I applaud them for it for the following reason.

Linguists have focused on analyzing language data either according to a notional-functional model of language or according to a structural-generative one--to the neglect of conventionalized phraseology which can be *both* lexicalized *and* syntactically variable. The problem for applied linguists has been that these epistemologically motivated interpretations from grammar, and of syntactic rules from lexical lists, preclude adequate accounts of the daily output of natural language by real, as opposed to 'ideal,' speakers in a discourse community. As noted by Pawley & Syder:

> Native speakers produce coherent strings of cohesive language. This discourse is nativelike, as opposed to possible grammatical alternatives which are not. The explanation for these facts has been largely overlooked by grammarians (1983, p. 191).

Comprehensive studies of phraseology, from invariant, idiomatic formulae to highly flexible lexical-syntactic collocations, would require a synthesis of structural and functional perspectives, just as natural language in use is a social and psychological synthesis of linguistic and extra-linguistic knowledge. Applied linguistics research is largely devoid of studies in this area of inquiry. But this situation is changing: practical interest in the interface of lexicon and syntax in language use has slowly increased over the past few decades.[2] Nattinger & DeCarrico's *Lexical Phrases* (not their first investigation into this area) can only help to accelerate the process.

Nattinger & DeCarrico themselves clearly recognize the cumbersome nature of their enterprise, and are at pains to point out the need for fundamental work on prefabricated language of various types. The authors are aware of the wide-ranging demands of their investigation: in Part One of the book (Chapters 1-4) they informatively relate LPs to most of the relevant literature (in cognitive psychology, language acquisition, discourse analysis, lexicography, text-analysis, second language learning, and so on). They have also done primary research of their own, presenting their notional-functional (speech act) classification of types of LPs in English (although this reviewer's caveats, as discussed previously, still apply). They also provide examples from Chinese, Russian, and Spanish in an appendix despite the fact that these suffer from the same classificatory and methodological murkiness of their presentation of English expressions.

Part Two of *Lexical Phrases* (Chapters 5-8) is a thought-provoking introduction to the potential applications of LPs to second-language pedagogy. The authors provide useful suggestions for incorporating LPs into the curriculum both in terms of spoken discourse (many of which hark back to the venerable notional-functional approach) and writing and reading (not as well-covered). Importantly, the authors discourage the conventional wisdom that spoken language is more predictable than written and attempt to show the relationship of LPs to the production and processing of

written text types from both sentence-level (micro) and various larger-text (macro) perspectives. Unfortunately, they do not clarify the relation of written LPs to their analytical classifications. I suspect that their repeated calls for further research are well-founded if the incongruities between metadiscourse and purely informational LPs are to be untangled. Overall, however, the second part of the book constitutes an enthusiastic call for classroom experimentation and a convincing argument that a knowledge of LPs is crucial to native-like fluency.

My main criticisms of *Lexical Phrases* have to do with not being told in sufficient detail about Nattinger and DeCarrico's own procedures for finding and classifying LPs as opposed to those of the many other researchers whose work they canvass. What is their observational methodology? Introspection and intuition? What is their overall form/function theoretical premise, that LPs of all types are lexicalized directly according to their conventionalized illocutionary force or cohesive effect or coherence marking across texts? From what I can infer, this is the (teleological) case. In searching for and recognizing LPs, the authors recommend a quantitative method used in collocational studies (pp. 21-22), but apparently it is not used by the authors themselves. They include an appendix listing LPs used in Chinese, Russian, and Spanish which were obtained by consulting native speakers (acknowledged on p. xii), so their assumption seems to be that LPs can be adequately inventoried via native speaker intuition. It is not convincing to operate *a priori* on the premise that a representative sample of LPs is accessible at a conscious level, and that once slapped with notional-functional 'speech act' labels and given minimal structural description.

The variability in the processing and production of formulaic speech suggests issues not accounted for by speech act theory. One essential implication is noted, then ignored, by the authors: that prefabricated language occurs ubiquitously in language use, and it is by no means necessarily motivated by the demands of ritualized social interaction.

Other functions may well suffice to account for the conventionality of LPs, most of which the authors mention in their theoretical discussion but which they fail to include in their analysis and classification of the data: providing social indexicality (signs of the speaker's membership in a discourse community and acceptance

of a group's epistemology/ideology, cf. Bolinger, 1976), increasing cognitive processing efficiency in memory retrieval and production-- crucial to language acquisition and fluency (Peters, 1977), and in the case of oral narrative, matching metrical cadences with recurrent topical material (Parry, 1971; Kiparsky, 1987).

As Nattinger and DeCarrico point out, the use of formulaic speech is not a language learning 'strategy' which is abandoned once language 'chunks' have been tested and analyzed; rather, it is an essential component of both fluent reception and production. Arguments for the fundamental importance of collocational knowledge (both declarative and procedural) and collocational processing have been advanced by corpus analysts such as Sinclair (1991), whose speculations concerning the continuous interaction of the 'idiom principle' (corresponding to lexicalized collocations) and the 'open choice principle' (corresponding to unique collocations) should have been considered in *Lexical Phrases*.

How--and the extent to which--formulaic or prefabricated speech plays a role in any or all text types, in language acquisition and performance, and for that matter, in verbal cognition, is a question which will no doubt enjoy the attentions of a growing number of researchers. *Lexical Phrases* provides a valuable and wide-ranging, if somewhat inchoate, introduction to this arena of inquiry.

NOTES

[1] I hesitate to call these taxonomies since they are in not systematic. They are, rather, conjoined lists, partonomies, which are perhaps presumed to cross-cut each other in ways which remain to be explored.

[2] By way of introduction to 'lexical phrases', in addition to the book under review, I recommend Pawley & Syder (1983), Peters (1977), and Bolinger (1976).

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Focus on American Culture. Elizabeth Henly. Englewood Cliffs, NJ: Regents/Prentice Hall, 1993. xiii + 144 pp.

Reviewed by
Lisa Maria Henschel
California State University, Los Angeles

    Focus on American Culture is part of the *ABC News* ESL Video Library, an interactive, task-based integrated skills package targeted for intermediate adult learners. Each text comes with corresponding video segments from such *ABC News* programs as *Business World, PrimeTime Live, 20/20, Nightline, The Health Show*, and *World News Tonight*, providing authentic language (in actual situations) through current events oriented videos that are of interest to students and teachers.

    The text is divided into four units: The Family in America, Work in America, Education in America and Trends in America. The topics represent four different aspects of the American lifestyle and provide a background for the development of analytical, communicative, and grammar skills.

    The chapters or "segments" in each unit are divided into five parts: Previewing, Global Viewing, Intensive Viewing, Language Focus, and Postviewing. In Previewing, students try to predict what the segment is about. This section helps to assess the students' familiarity and background knowledge with the subject content as well as introduce vocabulary that may be needed in order to understand the given segment. It also helps to gauge student reactions to the topic. Global Viewing encourages students' overall understanding of the subject matter through "True or False" exercises and follow-up discussions, facilitated by the teacher, where main ideas are stressed. Intensive Viewing focuses on specifics as students watch and listen for details in activities such as pre-outlined note taking with prompt questions and cloze-style transcriptions of key passages within specified time segments in the video. Language Focus develops vocabulary and idiomatic expressions as well as certain aspects of language structure in a contextualized manner. Finally, Postviewing wraps up the chapter with discussions, readings and other materials, as well as a final

team and an independent written task bringing skills and content together for a cohesive whole.

The introduction suggests an interactive approach to the use of the materials, with ideal conditions geared toward small group involvement. Students are encouraged to learn from one another and interact. The teacher functions more as a facilitator, leading students through a series of exercises that encourage autonomous discovery learning. Many activities have been incorporated to reinforce interaction, such as discussion topics on comparing cultures, team tasks, and field work. Grammar skills are theme-based and consist of fill-in and cloze style exercises. Though an excellent review of the segment content is achieved, it may not provide enough follow-up activities to use as a main text to reinforce grammar concepts. With the former exception, all skills are adequately covered.

Though the text and exercises are well designed and cover a wide range of skills, the topic choices are not ideal. The segments covering college entrance and bilingual education may be of general interest to second language learners; however, subjects such as "The Joys and Risks of the 'Daddy Track'", and "Mid-Life Moms" and a segment which discusses in-vitro fertilization might alienate students who feel insecure or shy about openly discussing such topics. Though disguised in a news-like format, these segments smack of sensationalism and display a bias toward "fringe yuppie" culture. Given our pluralistic society, this particularly narrow focus seems an odd way to introduce American culture. Even the cover, which features a baseball, seems out of context as there is no mention of sports whatsoever.

Despite the drawback of topic selection, the theme-based exercises are well conceived and written, providing the student with a range of tasks in order to facilitate comprehension. Each segment provides running times for videos and VCR starting points. Henly has created an incredibly teacher-friendly text, as well as a format that might work well for independent study.

Lisa Maria Henschel is a graduate student majoring in TESOL at California State University, Los Angeles. Her main area of interest is literacy, especially visual literacy. She is also the managing editor of COAGULA, a bi-coastal, bi-monthly art journal.

Newspapers by Peter Grundy. Oxford: Oxford University Press, 1993. 134 pp.

Reviewed by
Benjamin Q. Wang
University of California, Los Angeles

In the field of second language teaching, the Communicative Approach which emphasizes the use of real-life objects or texts in language teaching (Larsen-Freeman, 1986) is becoming more widely accepted. Research on second language teaching also suggests that instructional approaches that integrate content and language are generally more effective than those that isolate language learning from content areas (Genese, 1991). In bilingual education, the combination of language and content can even help students to develop thinking skills during the second language learning process (Romero, 1991). From a communicative point of view, materials from the media are considered an efficient tool to facilitate language learning because they integrate language and content in a very natural way. Many ESL/EFL teachers are interested in introducing various materials from the media into the classroom (cf. Brinton, 1991; Penfield, 1987), and newspapers are popular because of their high availability, low cost, real-life news value, and cultural information. However, second language teachers, as Penfield (1987) pointed out, are not always certain about how to adapt media for teaching purposes. Peter Grundy's book *Newspapers* is a resource book for ESL/EFL teachers that answers the question of how to adapt newspapers for the classroom.

Grundy does not present many re-printed newspaper articles in his book; instead, he provides "a range of original, practical ideas for working with newspapers" (p. 5). These ideas are presented in 100 creative activities which can be applied to both ESL and EFL classrooms with students at all language proficiency levels. These creative activities constitute the essential elements of this book.

The book contains six chapters. In the first chapter, "Working creatively with newspapers," Grundy suggests that teachers can start with their own teaching experiences. They can write a list of things to do with news stories, feature articles, and

advertisements and then compare their lists with their colleagues'. In this way, each teacher will find several different teaching activities related to newspapers. He also gives detailed suggestions on how to select newspaper articles and introduces some material resource books and textbooks. These suggestions can help ESL/EFL teachers start working with newspapers in their classrooms.

The remaining five chapters are as follows: "Building confidence and familiarity," "Working with texts," "Working with pictures," "Project work," and "Personal responses." Each chapter contains approximately 20 classroom activities. For each activity Grundy indicates the appropriate proficiency level, the time needed, the kinds of materials and preparations which are necessary, the language skill being focused on, and a detailed description of the procedure. Grundy indicates the "activity," "level," and "topic" of every section in Chapters 2 to 6 in the table of contents, features designed to allow the reader to conveniently choose activities. In section 2.1, for example, the "activity," "level," and "topic" are as follows: "When I hit the headlines," "Lower-intermediate and above," and "Relating newspapers to personal experience." Therefore, teachers may easily find the activities which are most appropriate to their own teaching needs.

Grundy has thoroughly covered a wide range of different language skills in his book. As vehicles of real-life information presented in written form, newspapers are an ideal material to teach reading and writing. In fact, most of the activities provided in the book focus on the development of these two skills. Grundy has made an effort to cover important reading skills, such as skimming, scanning, and reading for a purpose. He also frequently incorporates writing activities in the book, such as rewriting a story and writing an abstract.

The communicative activities in the book also naturally integrate reading with listening and speaking. Newspaper articles stimulate interesting topics for class discussions. Retelling stories is an activity which involves both speaking and listening. In some of the activities Grundy recommends using radio news broadcasts in conjunction with relevant newspaper articles, thus integrating authentic listening into newspaper related language teaching. Because vocabulary is recycled to a very high degree, both in the

newspapers and in news broadcasts (Blatchford, 1973; Brinton, 1978), this is also an efficient way to teach vocabulary.

Grundy presents some interesting activities that focus on developing authentic responses from the students, such as "Discover how tasteless popular journalism can be" (p. 127) and "Relating newspaper stories to experience" (p.123). These activities will help the students to forget class pressures and treat newspapers as real-life subject matter instead of textbooks. These activities also provide a cultural background for the learners, especially for those in EFL environments where there are not enough opportunities to experience authentic language materials.

One weakness of the book, however, is that the author does not provide enough materials to use with the activities. For example, in the activity mentioned earlier (i.e., "Discover how tasteless popular journalism can be"), the suggested materials are: "popular newspapers containing tasteless materials" (p. 127). Thus, teachers who plan to use this book will need to spend a large amount of time searching for and preparing materials. Most of the activities introduced in this book are based on the following crucial condition: the teacher should build a "Story Bank" which includes "several dozen, even several hundred, newspaper stories and articles" (p. 28). This is not an easy task especially for EFL teachers in a foreign country where the supply of English newspapers is limited.

Newspapers is a very good authentic activities handbook for ESL/EFL teachers. Its creative classroom ideas are a valuable resource for teachers who are interested in using newspaper articles. The creative activities presented in this book can be used in different types of classes with students of different language proficiency levels. With the help of this book, ESL/EFL teachers can use newspapers to expand their teaching materials in a significant way.

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Benjamin Q. Wang is a graduate student in the department of TESL & Applied Linguistics at UCLA. His research interests are functional grammar, second language acquisition, and interlanguage analysis.

EXCHANGE

On the Nature of Connectionist Conceptualizations and Connectionist Explanations

Foong-Ha Yap
Kanto Gakuin University
Yasuhiro Shirai
Daito Bunka University

In previous issues of *IAL* (cf. Fantuzzi, 1992, 1993), it was argued that connectionist explanations are too vague to qualify as theories of cognitive functions. Much of the argument hinges on the claim that hidden unit activation patterns of connectionist networks are currently too difficult to analyze, and that such opacity renders connectionist accounts virtually ineffective. However, recent attempts at analyzing connectionist hidden units using statistical techniques such as hierarchical clustering and principal component analysis reveal that connectionist networks easily yield categories which we traditionally associate with constituent structures (Elman, 1990). In this paper, we will focus on Elman's statistical analyses of the hidden unit activation patterns in his simple recurrent network on sentence prediction, first to highlight the feasibility of such analyses, and then to show how connectionist explanations contribute to the development of effective explanatory theories. In addition, in response to Fantuzzi's (1993) argument that connectionist conceptualizations do not qualify as connectionist explanations, we argue for the evolutionary nature of explanations as they relate to theory development, and for the role of conceptualizations as constructive intermediate explanations. Finally, to address Fantuzzi's (1993) criticism that pre-simulation connectionist conceptualizations are unproductive exercises akin to putting the cart before the horse, we provide examples to show that the relationship between

connectionist conceptualization and connectionist simulation is essentially an interactive one, and we conclude by advocating the more tenable simulation-*and*-theory approach over an unnecessarily restrictive simulation-*then*-theory paradigm.

ON THE NATURE OF CONNECTIONIST EXPLANATIONS

It was argued in Fantuzzi (1992, 1993) that connectionist explanations are too vague to qualify as theories of cognitive functions. To illustrate with an example from our previous discussions, Fantuzzi (1992), citing McCloskey (1991), states:

> While Seidenberg & McClelland (1989) have provided an explicit computer simulation of a cognitive behavior, McCloskey argues that the underlying theory of human cognition remains vague: just general statements to the effect that representations are distributed and similar words are represented similarly. (Fantuzzi, 1992, p. 328)

According to McCloskey, among the questions that Seidenberg and McClelland's model of word recognition and naming would have to address are: What regularities and idiosyncrasies does the network encode in response to the pool of words it encounters? How does the network represent the acquired knowledge over a set of connection weights? And how is the appropriate knowledge brought into play in the appropriate context? For example, how does the network determine the appropriate phonological instantiation of *a* in the case of regular words like *hate,* exception words like *have,* and nonwords like *mave?* (McCloskey, 1991, p. 390).
     In response to McCloskey's questions, Seidenberg (1993) points out that complex data sets like the ones connectionist models generate can be analyzed in many different ways in response to different research questions. In the case of the Seidenberg and McClelland model, for instance, the theoretical claims were about "the form in which knowledge is represented, not about the ways in which individual letters or sounds are encoded" (Seidenberg, 1993, p. 233). Theoretical issues, then, determined the kinds of analyses that were reported. Seidenberg

also points out that some of the questions McCloskey raises are already answerable, among them the question of the pronunciation of specific letters or letter patterns. What we need to do, according to Seidenberg, is to "observe the patterns of activations over the hidden units that occur for different spelling-sound correspondences" (p. 233). This is because the hidden units play a central role in helping the network develop appropriate internal representations capable of supporting the necessary (and often complex) input-output functions, which in this case involves grapheme-phoneme correspondences.

For those less familiar with dynamical systems[1] and dynamical explanations, the notion of "patterns of activations over hidden units" would, as Fantuzzi points out, mean nothing more than "general statements to the effect that representations are distributed and similar words are represented similarly"-- connectionist jargon that appears to describe rather than explain complex cognitive functions. Indeed, Fantuzzi (1992) is not alone when she points out that "the dynamics of complex nonlinear connectionist systems are difficult to analyze, and thus understand" (p. 328; see also McCloskey, 1991; Pavel, 1990; Rager, 1990).

Notions such as "patterns of activations over hidden units" do, however, provide deeper insights into cognitive functions. In what follows, we will illustrate this point with the help of a specific connectionist model, namely Elman's (1990, 1993) simple recurrent network on sentence prediction. We first describe the model and the cognitive behavior it simulates, then proceed to analyze its hidden units to discover the nature of its internal representation.

Like most other connectionist networks, Elman's network consists of a layer of input units which is connected to a layer of output units via an intermediate layer of "hidden" units (so called because it represents the network's internal representation). In addition to this basic connectionist structure, Elman's network also has a recurrent context layer that gives it a dynamic memory (see Figure 1). Activations from the hidden (or internal representation) layer are thus propagated, not only to the output layer, but in this case also to the context layer, which then feeds the activations back to the hidden layer to influence subsequent activations within the

network's internal representation. In so doing, the recurrent context layer enables the network to encode prior context, or temporal information, and thus to "live in time" (Plunkett, 1993, p. 55).[2]
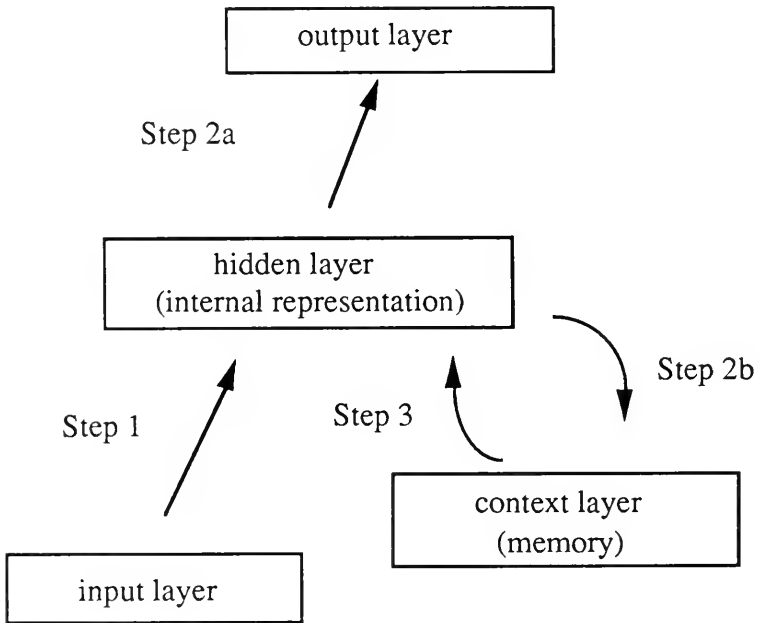

Figure 1. A recursive network that provides memory feedback via the context layer. Step 1 shows the input activating the hidden units to form an internal representation. Step 2a shows the hidden units generating an output. Step 2b shows the hidden units simultaneously updating the context layer with information about the internal representation. Step 3 shows the context layer supplying the hidden units with information about the network's prior internal representations. (Adapted from Elman, 1990, 1991, used with permission.)

Trained on a succession of words, presented one at a time, from an unbroken string of grammatically well-formed sentences, the network succeeded in abstracting several important properties

underlying human language. In the first simulation (Elman, 1990), the network learned to make lexical category distinctions between nouns and verbs on the basis of distributional evidence alone. In addition, it learned to make type-token distinctions, as well as grammatical role distinctions (such as subject versus object). In the second simulation (Elman, 1993), the network further learned to assign proper subject-verb agreement, even in the case of complex sentences that involved long-distance dependencies. Clearly, the network was encoding some fundamental linguistic properties. The question is *how*.

As emphasized earlier, notions such as "patterns of activations over hidden units" can be analyzed to provide important insights into a network's internal representation. Such analyses frequently make use of statistical techniques such as hierarchical clustering analysis and principal component analysis.[3] Elman (1990) employed the former, while Elman (1993), the latter.

Hierarchical clustering analysis is a technique that allows us to identify the similarity structure of the hidden unit activations. In effect, the technique permits us to use spatial organization at the hidden unit level to observe the categorization distinctions encoded within the network's internal representation (Elman, 1992). Principal component analysis, on the other hand, allows us to observe how hidden unit activations change over time. It does this by reducing the network's multi-dimensional internal representation to a set of more manageable 2 or 3-dimensional phase portraits, or graphs.

When Elman (1990) subjected the hidden unit activations in his network to a hierarchical clustering analysis, he obtained the tree shown in Figure 2. The tree reveals a *highly structured* internal representation. To begin with, *nouns* are clustered separately from *verbs,* indicating that the network has captured an important grammatical/syntactic distinction, namely that of lexical category. Moreover, within the noun cluster, *animates* form a separate category from *inanimates*. And further down the hierarchy, among the animates, *humans* are distinct from *non-humans,* while among the inanimates, distinctions are made between *breakables, edibles,* etc. These are semantic distinctions. What the cluster analysis reveals, then, is a hierarchy in which semantic clusters are nested within syntactic clusters (Elman, 1992; van Gelder, 1992). The analysis also reveals that verbs are further

differentiated into *those that require objects, those that optionalize objects* and *those that preclude objects.* These are differentiations involving verb argument structure, a linguistic property with strong semantic overtones, yet at the same time inextricably involved with grammatical/syntactic relations. What we see, then, is an internal representation in which the semantic and syntactic domains are intimately interlocked, such that both semantic and syntactic features are simultaneously instantiated. Here we get a glimpse into an internal representation in which both semantic and syntactic features intertwine to affect the course of language processing.[4] (See Figure 2).

What might it mean to have an internal representation in which the semantic and syntactic domains are intricately interwoven with each other? Before answering this question, let us first consider the results of a second, more elaborate cluster analysis on the same set of hidden unit activation patterns.[5] The analysis reveals the emergence of grammatical role distinctions such as subject versus object within the noun clusters. For example, within the BOY-cluster, *BOY-sleep* and *BOY-move-rock* occur closer to each other than to *woman-like-BOY* or *man-chase-BOY.* Indeed, barring a few exceptions, tokens of BOY-in-subject-role tend to occur closer to each other than to tokens of BOY-in-object-role. A similar distinction holds within other noun clusters. In fact, as Elman (1990) observes, "The differentiation is nonrandom" (p. 207).

The picture we get is one in which grammatical/syntactic distinctions are arranged in subset-superset relations. First, we have a lexical category distinction between nouns and verbs. Then, within the NOUN-cluster, we have a grammatical role distinction between subject-nouns and object-nouns. At the same time, we see a picture of grammatical role clusters nested within semantically-defined noun clusters (e.g., [+animate], [+human], [+masculine], etc.), which in turn are nested within lexical category clusters. The network does not instantiate a syntactic distinction devoid of semantic interpretation, nor vice-versa.
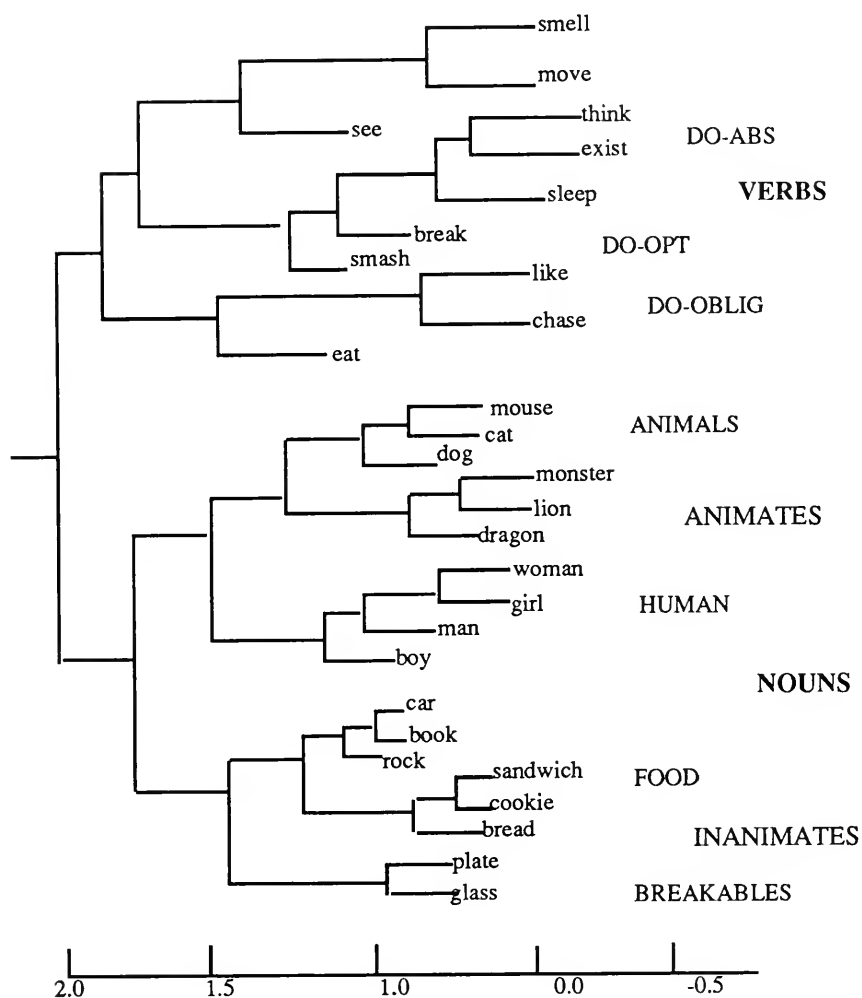
Figure 2. A hierarchical cluster diagram of the hidden unit activation
vectors in a simple sentence prediction task. Labels indicate
the inputs which produced the hidden unit vectors. Inputs
were presented in context, and the hidden unit vectors
averaged across multiple contexts. (Elman 1990, used with
permission)

The second cluster analysis also reveals how the network preserves type-token relations while at the same time allowing each token to be instantiated in a context-sensitive manner. For example, the analysis shows that all BOY-tokens are closer to each other than they are to GIRL-tokens. This is because tokens of the same type have hidden unit activations that are very similar-- certainly more similar to each other than to the activations of tokens of a different type. At the same time, no two tokens of the same type are exactly identical. *BOY-sleep,* for example, has a different internal representation from *BOY-move-rock* or *woman-like-BOY*. This is because each hidden unit activation pattern reflects its own unique prior context.

The above analysis is important because it shows that sensitivity to context "does not preclude the ability to capture generalizations" (Elman, 1991, p. 220). According to Elman, all the network needs to do is learn "to respond to contexts which are more abstractly defined" (p. 220). This is a simple task for the network. Given sufficient similarity in the hidden unit activation pattern, the network can easily abstract and generalize. At the same time, whatever is dissimilar automatically contributes to individual token identity. This use of context to establish generalizations about classes of items and at the same time to identify individual items is also significant from a processing perspective because it shows that types and tokens can be identified simultaneously, and without recourse to additional procedures such as indexing or binding operations which often feature prominently in traditional symbolic modeling (Elman, 1990).

The context-sensitivity of each token, in effect, means that its hidden unit activation pattern is subject to subtle adjustments as the token combines with other tokens (Elman, 1992). How the hidden units "accommodate" themselves as a token interacts with other tokens can be captured to some extent by phase-portraits, or graphs, obtained through principal component analysis. The graph in Figure 3 illustrates how hidden unit activation patterns are constrained by prior context. The graph shows the trajectories through state space for the sentences *boy **who boys chase chases** boy* and *boys **who boys chase** chase boy*. Note that the embedded clause for both sentences is the same. Nevertheless, the path taken by the vector representing the hidden unit activations for this

particular embedded clause varies slightly depending on the preceding context. In the first sentence, the prior context was a singular subject *boy*, while in the second sentence, the prior context was a plural subject *boys*. Each context produces its own expectations, and these expectations affect the pattern of hidden unit activations of the tokens that follow.
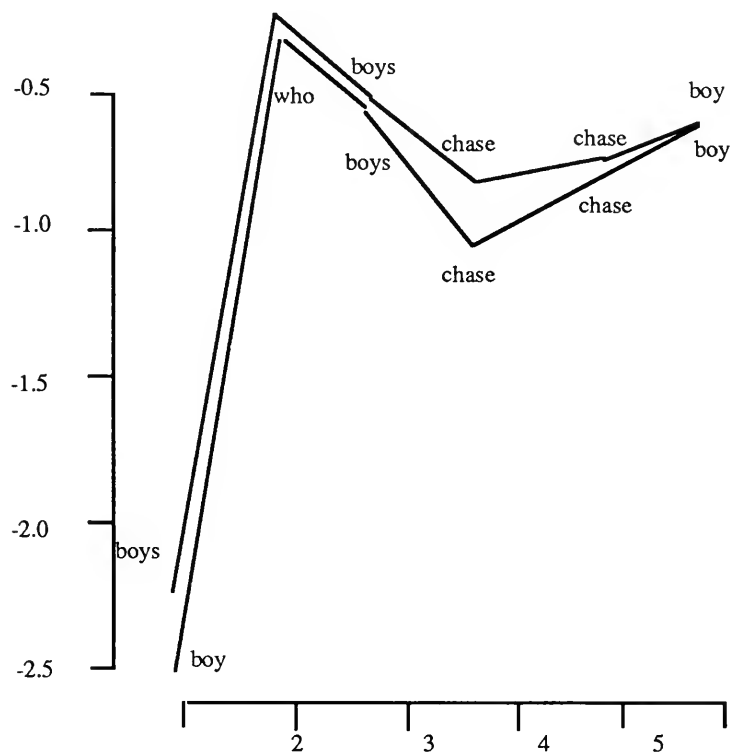

Figure 3. Plot of the movement through one dimension of the hidden unit activation space (the second principal component) as the successfully trained network processes the sentences *boy who boys chase chases boy* vs. *boys who boys chase chase boy*. The second principal component encodes the singular/plural distinction in the main clause subject. (Elman, 1993, used with permission).

Without going into further examples, due to space constraints, let us integrate the insights we have gained about the internal representation in Elman's network. This will help us address some of the questions raised earlier: What kinds of linguistic knowledge does the network encode? How is this knowledge represented in a distributed manner? And how is the appropriate knowledge brought into play in the appropriate context? From hierarchical clustering analyses, we know that the network encodes *constituent structure*. The constituents, however, do not have the discrete characteristics commonly associated with traditional symbolic representations. For example, instead of occupying a discrete location in memory, the constituents reflect their characteristics through a shared network of hidden units. Constituents are similar as well as dissimilar to other constituents in different ways, and this is reflected in the similarity structure of their hidden unit activation patterns. On the basis of their similarity and dissimilarity to other hidden unit activation patterns, their identity as individual tokens and their identity as members of different classes are recognized. Moreover, because hidden units are shared along many dimensions, a constituent often belongs to more than one type of category. For example, *boy* belongs to lexical category NOUN, semantic categories [+ANIMATE], [+HUMAN], [+MALE], etc., grammatical role category SUBJECT or OBJECT depending on its context, number category SINGULAR, which prompts verb agreement expectations in the event that *boy* is identified as a SUBJECT, and the list could go on. Information about the various category memberships is activated, not category by category, but all at the same time, and in conjunction with information about individual (or context-sensitive) token identity.

Nor are semantic and syntactic considerations delegated to autonomous domains. Because semantic categories are found nested within syntactic categories, and vice-versa, constituents are also bound to instantiate semantic and syntactic properties at one and the same time. This is possible because the internal representation of each constituent is a pattern of hidden unit activations, and not a single discrete hidden unit. In fact, by sharing hidden units, constituents are further able to exhibit finer-grained distinctions among category members when appropriate, thereby overriding the brittleness of all-or-none category

memberships. The question of when it is appropriate to make gradient distinctions and when it is appropriate to make all-or-none categorizations will, of course, be determined by the demands of the task--in other words, by the context.

Another important characteristic of the network's internal representation is that it is non-static. Whereas traditional symbolic representations tend to be "timeless" (Port & van Gelder, 1991), in the sense that they remain unchanged once learning or retrieval or production rules have acted upon them, network representations are dynamic, keenly sensitive to context, and thus at different points in time never quite the same, although similar enough for most categorization purposes. More importantly, as the trajectories derived from principal component analysis reveal, each pattern of hidden unit activations (with prior context encoded) constrains the next pattern of hidden unit activations. In other words, hidden unit activation patterns have "causal properties" or, as Elman (1991) puts it, "they are cues which guide the network through different grammatical states" (p. 221). In this sense, each constituent is dynamic and plays an active role in determining an entire composite representation (Port & van Gelder, 1991), be that composite representation a single sentence, a whole paragraph, or an entire discourse. In this sense, too, we see the emergence of grammatical relations--not in static, timeless fashion, but malleable to context and functioning in real time.

Clearly, the kind of internal representation found in Elman's network is very different from the kind conceived within the traditional symbolic paradigm. At the very least, the difference is significant enough to challenge us to give more serious thought to the temporal and integrative aspects of language representation. The arguments necessary to advance this new focus in language research have come from some innovative analyses into the hidden units of dynamic networks. Although some have argued that the explanations provided by these analyses are not explicit in the same way that symbolic explanations are explicit, it is important to bear in mind that network explanations are not so vague that they cannot broaden our conception of what counts as a viable scheme of linguistic representation within the human brain. With further research, some of these explanations may become more explicit, but it is also worth remembering that the so-called "vague explanations" mentioned earlier--those referred to as "general

statements to the effect that representations are distributed and similar words are represented similarly"--are the kinds of basic principles that keep re-surfacing across different domains. If, as proposed in Seidenberg (1993), one of the desiderata for theories of cognition is that they be able to show "how phenomena previously thought to be unrelated actually derive from a common underlying source" (p. 233), then connectionist explanations are way ahead in fostering the development of effective explanatory theories.

ON THE NATURE OF CONNECTIONIST CONCEPTUALIZATIONS

It is unfortunate that the value of conceptualization as explanation and as a precursor of theories has not always been fully appreciated. This undervaluation was highlighted in our previous exchange when Fantuzzi (1993) raised the question of whether conceptualization counts as explanation in SLA. Fantuzzi's own position is that "general conceptualizations are *not* explanations of linguistic behavior" (p. 309). Such a position, in our view, is much too restrictive. For while conceptualizations tend to focus on more abstract problems, or problems that are still fuzzily defined, which inevitably adds a general or notional flavor to them, to the extent that these conceptualizations help to clarify a problem and contribute to its solution, they nonetheless qualify as explanations.[6]

The tendency to undervalue conceptualization crops up from time to time, and perhaps more frequently in the case of some paradigms than in others, but for a field as new as connectionism, unfamiliarity with the nature of connectionist conceptualizations may have been an additional factor. In this section, we will draw on an extended example found in van Gelder (1992) to illustrate how connectionist conceptualizations contribute to the development of explanatory theories.

As discussed earlier, Elman's work has shown how a network capitalizes on the similarity structure of hidden unit activations to encode constituent structure. The structure, as revealed by cluster analysis, is hierarchically nested, such that both syntactic and semantic considerations constrain the class of possible successors in a sentence. A logical question that follows

is how other considerations such as phonological and discourse-pragmatic factors constrain the composition of an utterance. To answer this question, we would need to look at how these other factors are encoded in the network's internal representation. We would also need to observe how these factors interact and integrate with other factors to produce complex cognitive behavior. One way to proceed is to build a phonologically-sensitive network (perhaps somewhat like NETtalk) and train it on a discourse-based training corpus. Obviously, such an ambitious project cannot proceed atheoretically: We would need to narrow our search space with a clearer definition of what we expect the network to do, and if possible to anticipate the answers the network will reveal. As in other paradigms, the anticipations serve as hypotheses to be confirmed, rejected, or modified. These anticipations are conceptualizations, and are important to the process of theory construction.

Conceptualizations are not conceived in a vacuum. Like our language representations, they are constrained by prior knowledge[7]. Van Gelder (1992), for example, recalls the nested hierarchy used to encode semantic and syntactic distinctions in Elman's network, and postulates that "a host of further subtle contextual and pragmatic factors" are likewise encoded in "an extraordinarily intricate hierarchical structure of regions within regions," only this time the "cascade of regions with differing functional significances" would have to be much deeper, perhaps infinitely so (pp. 183-84). But how, one might ask, do we envisage a hierarchically nested structure that is infinitely deep? Are there similar constructs in other fields that can serve as metaphors to help us visualize something that we can only begin to vaguely imagine?

In an earlier work, Pollack (1989) had identified one such construct (the classical Cantor Set) in the domain of fractal mathematics. As van Gelder (1992) explains, this set consists of points obtained in the following manner:

> Begin with the set of all points on the unit interval (the segment of the real number line between 0 and 1) and delete the middle third open subinterval--that is, every point between 1/3 and 2/3, although being careful not to delete these two points themselves. We are now left with two intervals, each 1/3 the length of the original. Now delete the middle third

open subinterval of the remaining intervals, and so on ad infinitum. What remains is usually termed a 'dust'--an infinite set of points, systematically arranged in an infinitely deep hierarchy of clusters, such that between any two clusters at the same level there is a gap as big as those clusters. Thus, paradoxically, in this dust *the strict separation between clusters (and, eventually, points) is maintained at any level one cares to examine,* even though, given any distance, no matter how small, one can find an unbounded number of clusters that are less than that distance apart. (pp. 184-85, emphasis added)

The spatial organization in the Cantor Set reminds us of the hierarchical cluster found in Elman's network analysis. Without forgetting that a network's internal representations are in fact *highly distributed,* "not merely in the obvious sense that they are patterns taking place over a large set of hidden units, but--primarily--because they encode the relevant information about the input in a *superimposed* fashion" (van Gelder, 1992, p. 182, emphasis added), we can now go on to consider another important issue: How might fractal structures like the Cantor Set inform us about the *possible behavior* of deep nested hierarchies which encode not only semantic and syntactic constraints but other subtle contextual and discourse-pragmatic ones as well?

As discussed in van Gelder (1992), an important property of the Cantor Set is that clusters at the same level are divided by wide spaces, and these spaces give each cluster its distinctive identity. This property of distinctiveness is maintained even at the level of individual fractal points, no matter how infinitesimally close they might be to one another. In connectionist terms, this would mean that hidden unit activation patterns that are almost congruent can still exhibit subtle but distinctive properties. As van Gelder puts it, within a dynamical system like Elman's network, "[t]wo points in neighboring clusters would have much in common, but they would also have differences of functional significance that could eventually be very important for the future direction of processing in that system" (p. 192). For networks whose nested hierarchies must be *very deep* in order to encode numerous other constraints besides semantic and syntactic ones, the distance between neighboring points must be infinitesimally small, and this

would mean that even very slight variations in hidden unit activation patterns could make a subtle but significant difference in the processing output.

Such fine sensitivity to subtle changes would make the behavior of these networks appear chaotic at times (van Gelder, 1992), but one needs to remember that this chaos-like behavior is in fact entrenched in a type of internal representation that at the same time inherently honors type-token distinctions. Thus it appears that these networks, with their deep Cantor Set-like nested hierarchies, are well-suited to the paradoxical task of "capturing the order and regularity inherent in linguistic systems" and at the same time responding appropriately (and this could mean drastically) "to small changes in word order, intonation, or pragmatic context" (van Gelder, 1992, p. 193).

What van Gelder's conceptualization has done, then, is to provide us with a clearer idea of what an internal representation that has to encode numerous linguistic differentiations might look like and how such a representation might be expected to behave. In so doing, his conceptualization helps to more clearly define a possible line of simulation research that moves us closer toward an explanatory theory of language representation. Conceptualizations like van Gelder's are made possible by findings from previous simulation efforts, but are also enriched by attempts to seek out compatibilities with other fields. In fact, van Gelder points out that a possible consequence of drawing metaphors from a different domain like fractal mathematics is that we might discover the same set of principles (in this case, mathematically expressed) underlying not only cognitive functions but numerous other natural phenomena as well. It is in this more general but also more unifying sense, then, that conceptualizations often contribute to the development of effective explanatory theories.[8]

SIMULATION-THEN-THEORY, OR SIMULATION-AND-THEORY

Attempts are sometimes made to characterize a paradigm according to its research style. Thus, we come across observations about a paradigm being either theory-then-research oriented, or

vice-versa. Taken to the extreme, however, such characterizations can be counter-productive. One such example is found in the last exchange, when Fantuzzi (1993), observing that connectionist explanations are essentially "built bottom-up from a working model" (p. 296), argues that Shirai and Yap (1993), in attempting to come up with a general connectionist framework to account for language transfer phenomena prior to running actual simulations, "have the relationship backwards" (p. 303). While there is little doubt that general conceptualizations stand to benefit from the findings of specific simulations, it would be a mistake to assume that connectionist theorizing *cannot* proceed ahead of specific simulations.

As pointed out earlier, conceptualizations are rarely (if ever) conceived in a vacuum. For example, Shirai (1992) examined evidence from language transfer studies and discussed basic principles extracted from numerous connectionist simulation efforts. The purpose of general conceptualizations of this kind was to define a possible line of research that can help these conceptualizations gain greater specificity.

That connectionist research is not strictly bound to a simulation-then-theory approach is evident from the following illustration. In van Gelder (1992), we trace an interesting historical development: Armed with insights from exploratory forays into neuroscience and dynamical computational modeling, Paul Churchland (1986) postulated that "the brain represents various aspects of reality as a *position* in a suitable *state space*" (van Gelder, 1992, p. 179). As van Gelder notes, at the time, Churchland's statement was seen as an exciting but hopelessly bold speculation, yet in a matter of just a few years an explosion of connectionist simulations such as Elman's work had begun to rapidly clear some of the mysteries surrounding Churchland's postulate. And, as we have seen earlier in this paper, Elman's simulation efforts were followed by van Gelder's own bold conceptualization, which although is bound to invite criticism yet at the same time is sure to find its way into the theoretical underpinnings (whether explicit or implicit) of some researcher's simulation effort. What we see, then, is a principle of interaction and integration at work, not just at the level of hidden units within

a network's internal representation, but also at the level of conceptualization and simulation (i.e., in the way we as researchers go about formulating and formalizing our hypotheses and theories).

CONCLUSION

Thus far we have shown that connectionist explanations are not so vague that they cannot contribute to our understanding of how language is represented and processed. Nevertheless, since connectionism as a field is young, many questions remain to be explored. For instance, we have yet to address the question of how symbolic representations and processing might emerge from a subsymbolic (i.e., connectionist) architecture. As yet we still do not know if a hybrid symbolic-connectionist system holds the answer, or if the solution merely lies within a more sophisticated network. Nevertheless, the search for an answer is on, and philosophers and researchers like Clark and Karmiloff-Smith (1993) are proposing some interesting answers. Drawing on language acquisition and child development studies, and the results of relevant connectionist simulations, Clark and Karmiloff-Smith sketch a scenario in which a connectionist network makes use of cluster analysis to induce constituent categories (as discussed earlier), then submit these categories through another kind of statistical procedure known as "skeletonization" (cf. Mozer & Smolensky, 1989) to yield a more abstract version of each category. Through a series of skeletonization procedures, the network will eventually obtain explicit (i.e., symbolic) representations that are manipulable for novel combinations and transportable to different domains. In this way, Clark and Karmiloff-Smith argue, the connectionist network retains its sensitivity to contextual nuances by exploiting its implicit (i.e., subsymbolic, or distributed) representations, and at the same time acquires the flexibility to manipulate more explicit representations obtained through the process of skeletonization.

As with many other connectionist-based accounts, the sketch proposed by Clark and Karmiloff-Smith requires an understanding of how connectionist networks behave, but it also requires something more. It requires powers of perception,

reasoning and imagination for a researcher to integrate what (s)he knows about connectionist principles, cognitive principles, language acquisition principles, neurobiological principles, etc. The path to more plausible and more effective explanatory theories of cognitive functions requires that we recognize the value of broad conceptualizations in addition to explicit explanations. And it also requires that we conceptualize, and theorize, not only at the end of each simulation, but all the time.

ACKNOWLEDGMENTS

NOTES

[1] A system is said to be dynamical when its behavior evolves over time. An excellent example is the human brain with its non-static flow of neural excitations and inhibitions. Another good example is the connectionist network with its ever-changing pattern of hidden unit activations. Each dynamical system can be studied as a closed system in which their state at any given time can be captured in terms of values of a set of parameters. The values of these parameters change in interdependent ways as the system evolves and often it is possible to capture the changing behavior of the system by means of equations. As van Gelder (1991) points out, these equations can be used to address some important research questions, for example, how the system got to be in the state it is in, and what states it will move on into next. Van Gelder goes on to point out, however, that "dynamical explanations may proceed without making explicit use of the equations governing the system" (p. 500), as often happens when researchers do not have all the equations for a complex system, or when researchers do have the equations but prefer to use some more perspicuous way of explaining how the system works. Van Gelder cites the use of state trajectories in connectionist research (discussed a little later in the main text) as an example when explanations of particular features of a network's behavior can proceed without adverting to the full equations which formally govern the behavior of the network.

[2] It is worth noting that previous connectionist simulations often did not incorporate the temporal aspect of cognitive functions. By adding a temporal dimension to his simulation, Elman (1990, 1993) was able not only to explore the spatial

organization of network representation; he was able to analyze its dynamical properties as well.

[3] Elman (1991) mentions several other techniques for network analysis, among them weight matrix decomposition (McMillan & Smolensky, 1988), skeletonization (Mozer & Smolensky, 1989) and contribution analysis (Sanger, 1989).

[4] The intimate interaction between syntactic and semantic features sometimes makes it difficult to identify which particular features make the biggest difference in processing outcome. For example, Fantuzzi (1993), citing Kim, Pinker, Prince and Prasada (1991), argues for the role of syntax in determining whether a novel verb tends to be regularized for past tense, while Harris (1992, 1993) argues for the greater role of semantics.

Kim et al.'s work is on past tense naturalness ratings. They attributed the difference in naturalness ratings of past-tense forms to each verb's derivational status: a novel verb derived from a noun is more natural with regular past, while that derived from a verb is more natural with irregular past. They thus attribute the difference in naturalness ratings to syntax. Harris (1992, 1993), however, has proposed an alternative account, claiming that naturalness with irregular past is dependent on how much of a word's original meaning is preserved in the derived verb. Since most of the denominal verbs used by Kim et al. were semantically very distant from the original noun, it is only natural that they did not show high ratings for irregular past. In fact, when controlled for semantic similarity, denominal verbs and deverbal verbs did not show a statistically significant difference (Harris, 1993). This also shows that syntax and semantics are closely intertwined; the phenomenon attributed primarily to grammatical status (noun vs. verb) turned out to be more dependent on semantic factors (see also Stemberger (1993) for the strong effect of phonological factors in determining the regularizability of a verb).

It should also be pointed out that Marcus, Brinkman, Clahsen, Wiese, Woest and Pinker's (1993) argument (also cited by Fantuzzi) that connectionism cannot handle minority default plurals such as those seen in German and Arabic is also countered by Plunkett (1994), who argues that the minority default is problematic only for single-layered networks such as used in Rumelhart and McClelland (1986), and not problematic for multi-layered networks that have intermediate structures, and in fact his network successfully learned Arabic plurals.

[5] Whereas the first cluster analysis *averaged* all instantiations of the hidden unit patterns for each lexical item into a single vector, the second cluster analysis charted *every instantiation* of these patterns. Thus, whereas the first analysis involved just 29 vectors (one per lexical item), the second analysis ended up with 27, 354 vectors (one for every lexical item in a different context). The overall structure of the trees from both analyses are the same, but finer distinctions are visible in the second, more elaborate tree (Elman, 1992).

[6] It should be emphasized here that we are not advocating vague explanations nor vague theories. Contrary to Fantuzzi's claim, Shirai and Yap (1993) did not maintain that vagueness is all that can be expected from connectionist models. The point we made was that many linguistic phenomena are "beyond precise description by categorical rules" (p. 122), and thus any attempt to capture these phenomena in *categorical* terms would at best result in something "vague" (in the sense of "approximate" or "imprecise" rather than in the sense of "unclear"). In fact, we underscored that a partiality for categorical descriptions is what limits the effectiveness of classical/symbolic explanations, while connectionist explanations do a better job with their soft constraints (or "soft rules").

[7] Note that the terms prior context and prior knowledge are easily interchangeable. Although not discussed in this paper, prior context/knowledge need not always take the form of temporal information that finds its way into the internal representation from the external environment. It is conceivable that complex systems like the human brain may consist of several networks interacting together, in which case prior context/knowledge for a particular network can take the form of information previously stored within a neighboring network.

[8] It is in this same spirit that Shirai (1992) attempts to articulate a general framework for language transfer phenomena from the perspective of a different (in this case, connectionist) domain.

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Foong-ha Yap holds MA degrees in English and TESL, from Loma Linda University and UCLA respectively. Currently she teaches English at Kanto Gakuin University in Kanagawa, Japan. Her research interests include cognitive models of language learning, and neurobiological perspectives on language acquisition.

Yasuhiro Shirai has a Ph.D. in applied linguistics from UCLA, and is now an associate professor in the Department of English at Daito Bunka University in Tokyo, Japan, where he teaches linguistics, first language acquisition, and EFL. His research interests include crosslinguistic acquisition of tense-aspect morphology and cognitive models of L1/L2 acquisition.

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